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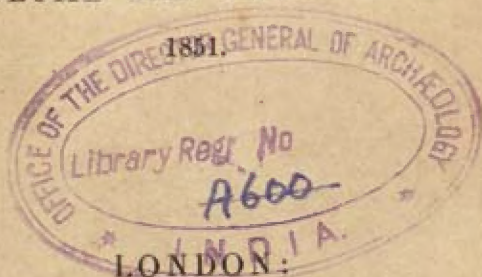


THE
JOURNAL
OF THE
ROYAL GEOGRAPHICAL SOCIETY
OF
LONDON.

25226

VOLUME THE TWENTIETH.

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Map of Arabia.
Middle Island of New Zealand.

Royal Geographical Society.

1850.

REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING, 27TH MAY.

THE Council, according to custom, have to make their Annual Report upon the general affairs of the Society since the last Anniversary.

The number of its Members in the past year has been increased by 22 new members, whilst, on the other hand, there have been only 5 resignations. We have, however, to regret the loss by death of 24 Members, of whom 2 were Honorary, and 2 Corresponding.

The Society now comprises 727 Members, of whom 666 are Ordinary, 39 Honorary, and 22 Corresponding.

Finance.—A reference to the accompanying Balance-Sheet will show that the Estimates laid before you last year have been closely adhered to; and the Council have the satisfaction further of observing that the income of the Society is again *reviving*, after having suffered from the pressure of the times, in common with many other similarly constituted associations.

The property of the Society now consists of 222*l.* 1*s.* 10*d.* stock, with a balance at the banker's of 300*l.* on the general

account, and of 41*l.* 6*s.* 11*d.* belonging to the Library Fund, *without any accounts outstanding*—a statement on which they consider they may fairly congratulate the Society.

Our other assets consist—

1st. Of the Stock remaining on hand of the Society's Journal, from the sale of which we may always expect some addition to our annual income:

2ndly. Our extensive collections of Books, Maps, and Charts now become of considerable importance.

The Society, perhaps, may not be generally aware that our Library contains upwards of 4000 volumes, amongst which are many works of great rarity and value; 150 atlases; more than 1000 pamphlets; 10,000 maps and charts; and many models and other objects illustrative of geographical science, constituting altogether one of the most important collections of the kind ever formed by any similar body.

It is hardly necessary to mention that the collection is *available as a circulating library for the use of the Fellows*.

The accessions during the past year consist of nearly 500 books and pamphlets, 5 atlases, and 250 maps and charts in sheets.

Amongst the most valuable of our new acquisitions may be mentioned—

Layard's *Monuments of Nineveh* (folio, 100 plates).

Maury's *Wind and Current Charts*.

Lynch's *Map of the Jordan and Dead Sea*.

Atlas of Iceland, by the Icelandic Society of Denmark.

Col. Chesney's *Expedition to the Euphrates and Tigris, &c.*

To Sir Walter C. Trevelyan, Bart., and to Charles Baring Young, Esq., the Society are especially indebted for their very liberal gifts of books to the Library.

Library Fund.—This Fund, raised by the individual subscriptions of a few of the Fellows, has proved a most valuable

contribution. An account of its appropriation will appear in the supplementary Balance-sheet annexed; and the Council consider that the Society is greatly indebted to the gentlemen in question for having furnished the means of rendering a very valuable portion of our geographical stores as available for easy reference as the limited extent of our apartments admit.

The Arrears due to the Society amounted on the 1st of January last to 600*l.*, of which 100*l.* has been since recovered. The stringent rule which was passed last year with respect to defaulters will oblige us to cancel the greater part of this debt in the manner therein prescribed, but it will prevent hereafter the possibility of any such large accumulations under this head.

Royal Donation.—The Council have this year only awarded one gold medal, conferred upon John Charles Fremont, Esq., formerly of the United States Topographical Engineers, for his very important geographical labours in the far West; of the North American Continent, a particular account of which has been published in his work illustrative of his new map of Oregon and California, a copy of which has been presented by him to the Society.

The remaining portion of the Royal Donation, placed by Her Majesty at the disposal of the Council, has been awarded *in money* to the Rev. David Livingston, the enterprising missionary, who started last year from Kolobeng (South Africa) for the great lake of Ngami in the interior, which he and his companions, Messrs. Oswell and Murray, have been the first Europeans to reach, and correctly to lay down.

The President will, as usual in his annual Address, more particularly state the grounds on which these awards have been made to the gentlemen in question.

Publications.—Two Parts of this Journal have been published

since our last annual meeting, and will be delivered free of charge to all Fellows of the Society applying for them. The next part, due in July, will contain several papers of great interest, and will be of larger dimensions than those which have preceded it.

Catalogue.—At the first meeting of the Council in the present Session your Secretary laid before them a catalogue, alphabetically arranged, of the books and pamphlets belonging to the Society, which with great labour he had prepared during the previous recess with the assistance of the clerk. This catalogue has been submitted to a Committee, and Mr. Greenough has been prevailed upon to superintend its progress through the press. The want of a catalogue for reference had long been felt, and will add greatly to the utility of our library when completed.

In conclusion, the Council have only further to state, that the application, alluded to in the last annual Report as having been made to Her Majesty's Government for suitable apartments, or for a grant of public money to provide them for the Society, is still pending; no specific reply having been received from Lord John Russell. The President, however, has again brought the matter under his Lordship's attention in a letter, setting forth the strong claims which the Royal Geographical Society can advance for such assistance at the public expense; founded, as he has ventured to state, upon a large and liberal expenditure of our funds for the encouragement of useful enterprise in the cause of geographical discovery, and for the special promotion of a science of the first importance to a commercial nation: 7000*l.* expended upon a Journal disseminating geographical information in every part of the world, and upwards of 4000*l.* more advanced in furtherance of various exploring expeditions, the results of which, especially that in Guayana, have been of great utility to the public, constitute claims of no slight weight. Her Majesty's Govern-

ment have on so many occasions been pleased to lend a willing ear to the suggestions of this Society, that the Council cannot but believe they will be equally inclined, when convenient, to consider favourably the appeal which has been made to them for aid in that particular form, which, whilst to us it is of almost vital importance, will enable the Society to redouble its exertions in furtherance of those objects which they believe to be of no small interest to the public. In the mean time, the Council cannot too earnestly impress upon the Fellows the necessity of making every exertion to add to our numbers, and thereby to our means of becoming still more useful in that particular branch of science for the promotion of which we are associated together.

Balance-Sheet for the Year 1849.

Balance at Banker's, January 1, 1849				Amounts owing December 31, 1848.					
£.	s.	d.	£.	s.	d.	£.	s.	d.	
229	18	3	331	11	0½	House Rent and Fixtures	65	18	3
1	12	9½				Salaries and Wages	78	10	0
						Firing and Lights	11	14	0
						Stationery	5	16	11
						Ramateur Company	0	2	0
						Books and Maps	3	17	0
						Printing—Journal, Vol. XVIII.	127	2	1
						“ Miscellaneous	1	0	6
						Illustrations—Journal, Vol. XVII., Part II.	18	4	7
						“ Vol. XVIII.	32	12	4
						Insurance	50	10	11
							3	0	6

Examined and found correct, March 9, 1850.

GEO. O'GORMAN, } Auditors.
JAMES WYLD.

ROBERT BIDDULPH, Treasurer.

Dr.

LIBRARY FUND.—RECEIPTS AND EXPENDITURE.

Cr.

	£.	s.	d.		£.	s.	d.
Amount received up to December 31, 1848	186	8	0	1848.—Circulars inviting Subscriptions	..	2	5 0
Subscriptions received during the Year 1849	56	6	0	1849.			
				Jan. 15. Malby, for Map-mounting	..	44	13 6
				" 23. Phillips, for Bookbinding	..	60	0 0
				" 30. Holland, for raising Library Shelves	..	8	17 6
				Feb. 14. Phillips, for Bookbinding	..	25	16 0
				" 27. Holland, for Bookcase	..	7	7 0
				May 26. Latzenberger, for repairing Cartons	2	5	6
				" " Brass Pins for Map-Racks	1	4	10
				" " Carpenter	0	15	0
				Nov. 20. Assistance in Cataloguing Library	..	4	5 4
				" 29. Malby, for Map-mounting	..	1	1 6
				Dec. 12. Phillips, for Bookbinding	..	16	10 3
				" 22. Clemence, for Book-shelves and Frames for Map-boxes	..	12	16 6
				" " Rice, Stationer	..	9	5 0
				" 24. Latzenberger, for Cartons	..	4	16 0
				Balance at Bankers	..	3	13 6
Total Amount received					..	41	6 11
						£242	14 0

February 4, 1850.—Examined and found correct.

 GEO. O'GORMAN, }
 JAMES WYLD, } *Auditors.*

ESTIMATE FOR THE YEAR 1850.

Receipts.

Expenditure.

	£.	s.	d.	£.	s.	d.
Arrears, considered good	.	.	100 0 0	To Printer, for Part II. of Vol. XIX, (published Jan. 14, 1850)	.	74 7 10
Advertisements in Vol. XIX., Part II.	.	.	20 0 0	Balance in favour of the Society, Jan. 1850	.	56 18 8
Balance at Banker's, January, 1850	1	8	6			
of Petty Cash	9	18	0			
			<u>131 6 6</u>			<u>131 6 6</u>
Balance owing to the Society	.	..	56 18 8	House Rent and Fixtures	.	263 13 0
Entrance Fees of 20 Fellows at 3 <i>l</i>.	.	..	60 0 0	Salaries and Wages	.	261 0 0
Subscriptions of 215 Fellows at 2 <i>l</i>.	.	..	430 0 0	Journal, Vol. XX., Printing	.	150 0 0
Composition of 3 Fellows, at 25 <i>l</i>.	.	..	75 0 0	Illustrations	.	30 0 0
Royal Premium	.	..	52 10 0			
Borneo Mission (Rent)	.	..	30 0 0	Miscellaneous Printing	.	15 0 0
Dividends on 2200 <i>l</i> . Stock	.	..	69 12 8	Furniture and Repairs	.	10 0 0
Sale of Journals	.	..	80 0 0	Insurance and Advertisements	.	7 14 4
			<u>£834 1 4</u>	Royal Premium	.	46 14 0
				Office Expenses, including Firing, Lights, Evening Meetings, Stationery, Postages, Stamps, &c.	.	70 0 0
						<u>£834 1 4</u>

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ROYAL GEOGRAPHICAL SOCIETY.

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(36)

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(23)

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Receipts.			Expenditure.		
£.	s.	d.	£.	s.	d.
Arrears, considered good		100 0 0	To Printer, for Part II. of Vol. XIX. (published Jan. 14, 1850)		74 7 10
Advertisements in Vol. XIX., Part II.		20 0 0	Balance in favour of the Society, Jan. 1850		56 18 8
Balance at Banker's, January, 1850	1 8 6				
of Petty Cash	9 18 0				
		131 6 6			131 6 6
Balance owing to the Society			House Rent and Fixtures		263 13 0
Entrance Fees of 20 Fellows at 3 <i>l</i> .		56 18 8	Salaries and Wages		261 0 0
Subscriptions of 215 Fellows at 2 <i>l</i> .		60 0 0	Journal, Vol. XX., Printing		
Composition of 3 Fellows, at 25 <i>l</i> .		430 0 0	Illustrations	150 0 0	
Royal Premium		75 0 0		30 0 0	
Borneo Mission (Rent)		52 10 0	Miscellaneous Printing		180 0 0
Dividends on 2200 <i>l</i> . Stock		30 0 0	Furniture and Repairs		15 0 0
Sale of Journals		69 12 8	Insurance and Advertisements		10 0 0
		80 0 0	Royal Premium		7 14 4
			Office Expenses, including Firing, Lights, Evening Meetings, Stationery, Postages, Stamps, &c.		46 14 0
					70 0 0
					£854 1 4

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 *Hubbard, Gillibrand, Esq.
 Hughes, Edward, Esq.
 Hughes, William, Esq.
 *Hume, Edmund Kent, Esq.
 Huntley, Captain Sir H. Vere, R.N.
 320 Hutton, William, Esq.

I.

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 *Irby, Frederick, Esq.

J.

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 *Jenkins, R. Castle, Esq., F.S.S.
 Jervis, Major T. B., E.I.C. Eng., F.R.S.
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 330*Jones, William H., Esq., F.H.S.

K.

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 *Koppel, Col. the Hon. George, M.P., F.S.A.
 *King, Captain Philip Parker, R.N., F.R.S., F.L.S.
 King, Major Edward, 36th Regt.

L.

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 *Laird, M'Gregor, Esq.
 *Lance, John, Esq., F.L.S.
 340 Law, William J., Esq.
 *Law, the Hon. Henry Spencer
 *Leake, Lieut.-Col. W. M., F.R.S., &c.
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 350 Lewis, Captain Locke, R.E., F.R.S.
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 Surv.-Gen. Mauritius.
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 Thornton, Rev. T. Cooke, M.R.I.
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 *Tuffnell, Henry, Esq., F.R.S., G.S.
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 Twiss, Dr. Travers, D.C.L., F.R.S.

U.

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V.

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 *Vane, Lord Harry, M.P.
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 F.S.A.
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W.

- 570 Wade, Major-General Sir Claude M.,
 C.B.
 Walker, James, Esq., C.E., F.R.S.
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 E.I.C.
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 *Westminster, the Very Rev. the
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 *Wilson, Belford Hinton, Esq.
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Y.

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 *Young, George F., Esq., M.P.
 *Young, James, Esq.
 Young, Charles Baring, Esq., M.S.S.
 *Yorke, Lieut.-Colonel, F.R.S.

NAMES OF INDIVIDUALS TO WHOM THE ROYAL PREMIUM HAS BEEN AWARDED. ---

- 1831.—Mr. RICHARD LANDER, for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin, in Central Africa.
- 1832.—Mr. JOHN BISCOE, for the discovery of the land now named "Enderby's Land" and "Graham's Land," in the Antarctic Ocean.
- 1833.—Captain Sir JOHN ROSS, R.N., for discovery in the Arctic Regions of America.
- 1834.—Major Sir A. BURNES, C.B., F.R.S., for the navigation of the River Indus, and a journey by Balkh and Bokhara across Central Asia.
- 1835.—Captain Sir GEORGE BACK, R.N., for the discovery of the Great Fish River, and navigating it to the sea on the Arctic Coast of America.
- 1836.—Captain ROBERT FITZROY, R.N., for the survey of the shores of Patagonia, Chile, and Peru, in South America.
- 1837.—Colonel CHESNEY, R.A., F.R.S., for the general conduct of the "Euphrates Expedition" in 1835-6, and for the accessions to comparative and physical geography relating to the countries of Northern Syria, Mesopotamia, and the Delta of Susiana.
- 1838.—Mr. THOMAS SIMPSON, [Founder's Medal,] for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.
- Dr. EDWARD RÜPPELL, [Patron's Medal,] for his travels and researches in Nubia, Kordofán, Arabia, and Abyssinia.
- 1839.—Mr. R. H. SCHOMBURGK, [Patron's Medal,] for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.
- Major H. C. RAWLINSON, E.I.C., [Founder's Medal,] for his travels and researches in Susiana and Persian Kurdistan, and for the light thrown by him on the comparative geography of Western Asia.
- 1840.—Lieut. RAPER, R.N., [Founder's Medal,] for the publication of his work on "Navigation and Nautical Astronomy."
- Lieut. JOHN WOOD, I.N., [Patron's Medal,] for his survey of the Indus, and re-discovery of the source of the River Oxus.
- 1841.—Captain JAMES CLARK ROSS, R.N., [Founder's Medal,] for his discoveries in the Antarctic Ocean.
- Rev. Dr. E. ROBINSON, of New York, [Patro's Medal,] for his work entitled "Biblical Researches in Palestine."

- 1842.—**MR. EDWARD JOHN EYRE**, [Founder's Medal,] for his explorations in Australia.
- **Lieut. J. F. A. SYMONDS**, [Patron's Medal,] for his survey in Palestine and levels across the country to the Dead Sea.
- 1843.—**MR. W. J. HAMILTON, M.P.**, [Founder's Medal,] for his researches in Asia Minor.
- **Prof. ADOLPH ERMANN**, [Patron's Medal,] for his extensive geographical labours.
- 1844.—**M. CHARLES RITTER**, [Patron's Medal,] for his important geographical works.
- **Dr. BEKE**, [Founder's Medal,] for his extensive explorations in Abyssinia.
- 1845.—**COUNT P. E. DE STRZELECKI**, [Founder's Medal,] for his extensive explorations and discoveries in the South-Eastern portion of Australia, and in Van Diemen's Land; and for his valuable work, in which he has consigned the results of his observations.
- **Professor A. TH. MIDDENDORFF**, [Patron's Medal,] for his extensive explorations and discoveries in Northern and Eastern Siberia.
- 1846.—**Captain CHARLES STURT**, [Founder's Medal,] for his various and extensive explorations in Australia.
- **Dr. LUDWIG LEICHHARDT**, [Patron's Medal,] for a journey performed from Morton Bay to Port Essington.
- 1847.—**Captain CHARLES WILKES, U.S.N.**, [Founder's Medal,] for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838-42, and for the volumes which he has published, detailing the narrative of that expedition.
- **Sir JAMES BROOKE**, Rajah of Sarāwak and Governor of Labuan, [Patron's Medal,] for his expedition to Borneo.
- 1848.—**AUSTEN H. LAYARD, Esq., D.C.L.**, [Founder's Medal,] for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.
- **Baron CH. V. HÜGEL**, [Patron's Medal,] for his enterprising explorations of Cashmere and surrounding countries, communicated in his work entitled "*Kashmir und das Reich der Siek*," and for his collections of plants and animals of Australia and Upper India.
- 1849.—**Col. JOHN CH. FREMONT**, of the United States Topographical Engineers, [Patron's Medal,] for his successful exploration of the Rocky Mountains and California; for his numerous Discoveries and Astronomical Observations, made under circumstances of peculiar difficulty, as published in his "*Geographical Memoir on Upper California*," illustrative of his Map of Oregon and California," and presented by him to this Society.
- **The Rev. DAVID LIVINGSTON**, of Kolobeng, [25 Guineas,] for his successful journey, in company with Messrs. Oswell and Murray, across the South African Desert; for the Discovery of an interesting Country, a fine River, and an extensive inland Lake. Communicated to this Society by the London Missionary Society and by Capt. Thos. Steele, F.R.G.S.

PRESENTATION
OF THE
ROYAL AWARDS,

FOR THE ENCOURAGEMENT OF GEOGRAPHICAL SCIENCE AND
DISCOVERY, TO COL. J. C. FRÉMONT AND TO THE
REV. D. LIVINGSTON.

THE Annual Report of the Council having been read by the Secretary, the President addressed the meeting as follows :—

“GENTLEMEN,—After the Report which you have just heard, it remains for me to carry into effect the decision of your Council, as therein expressed; and it becomes a pleasing duty to deliver, from this Chair, the Honorary Gold Medal awarded by that decision, in pursuance of the principle of recognising and encouraging geographical undertakings of great interest and obvious practical utility. The services of Colonel Frémont are well known to most of the present meeting, having been brought before your notice last year by my predecessor. It therefore behoves me merely to make a brief mention of my own impressions as to the merits upon which this gentleman is the object of your attention, and who this day constitutes another link in the vast chain of connection which unites the esteem and labour of England with those of the United States of America—two countries of paramount importance in the maintenance of every generous and ennobling principle that can assist or adorn humanity.

“I had for some years back heard of the active energies of Colonel Frémont, from several sources; but when, in 1845, my friend Captain John Henry Aulick, of the U.S. Navy, kindly forwarded me a copy of the Report of the Exploring Expedition to the Rocky Mountains in 1842, and to Oregon and North California in 1843 and 1844, I confess that I was equally surprised and pleased. Having myself worked in the Surveying Department, I am well aware of the manifold difficulties of conveying choice instruments, and making delicate observations, under far less opposing circumstances than those experienced by Colonel Frémont; and it is therefore that surprise increased my satisfaction. The singular mountain, the beautiful plain, the vast inland sea, and other geographical discoveries, might naturally be looked for in the first examination of so extensive a region of the world; and a mere *reconnaissance* of the country travelled through would have been, perhaps, all that could be expected from even zealous and accomplished pioneers. But assuredly my admiration was excited when—in addition to topographical, geological, and botanical information—I found a series of astronomical operations seldom equalled

by explorers of unknown inland tracts. In closely examining the recorded observations, as well those for fixing latitudes as the altitudes of celestial bodies for rating the chronometers, and the meteorological tables by which the refraction of those bodies is corrected and the elevation of the land approximated, our applause is claimed as well for the head which plans as the hand which executes and faithfully registers the results. And we have before us unequivocal evidence that such is Colonel Frémont, and that in him, are combined qualities rendering him of all others the very individual fitted for the duties assigned to him, in each of which he has evidently acquitted himself with spirit, intelligence, perseverance, and methodical accuracy.

"It has always been a principle understood and practised by your Council, and I think properly, that work of whatever excellence or utility, where it is only the result of the official employment of its author, is not to be placed in competition with the labours and investigations of spontaneous individual exertion; our medal not being intended to note our approbation of the ability or merits of men appointed to public stations, from their being already known to be adapted to carry out public objects. Now in the award before us, this rule of judgment has been strictly adhered to; for though two of the exploring expeditions in which Colonel Frémont distinguished himself so highly in the Far West, were undertaken by order of his Government, the third, that memorable one in which he and his intrepid companions encountered as many hardships and dangers as can possibly distress an enterprise, was entirely a private undertaking.

"After the Colonel left the corps of Topographical Engineers, upon which he has reflected honour, he emigrated to California as a citizen-settler; but the 'ruling passion' still maintained its full influence over him, for, with anything but a Californian impulse, he carried with him a well-selected stock of astronomical and surveying instruments, with the view of indulging in his scientific pursuits at such intervals as his other engagements would allow. Among other objects, he was desirous of establishing a large garden and botanical institution near San Francisco. Such a person was, however, too useful and highly regarded to be left to follow only the bent of his inclinations there, insomuch that, in the last year, he was elected a Senator in Congress for the new State of California, and is now, I believe, at Washington holding that important station.

"This, then, is the man on whom you have this day bestowed the highest distinction which it is in your power to confer; and I cannot but conscientiously congratulate you on the propriety and justice of your award. By the masterly treatment of all branches of his explorations, he has left his sign-manual, as it were, upon the surface of the earth, and his name is henceforth inseparably connected with the geographical history of the world. He is now embarked in a wide and weighty career; and, as the Hon. John Charles Frémont is said to be the youngest man in the Congress, it is to be devoutly hoped that he will long enjoy the fruits of his well-earned reputation."

The President, then addressing the American Minister, said,—

"MR. LAWRENCE,—We are delighted that you have this day honoured our Anniversary Meeting, on the occasion of thus rendering a sincere tribute of our regard for the geographical labours of your distinguished countryman. And in using the word 'honoured,' I do it under conviction; for although we should be proud of receiving any Ambassador on such an occasion, it becomes me to remark how highly that honour is enhanced by its being so earnest a promoter of knowledge, as the Hon. Abbott Lawrence, who now appears among us. Your munificent exertions, Sir, in the cause of sound education are well known to us; and we hope that this medal will be the more valuable to Colonel Frémont from passing through the hands of so estimable a patron of science as your Excellency."

Mr. Lawrence, on receiving the medal, replied,—

"MR. PRESIDENT,—It is with great pride and satisfaction that I am here to receive at your hands the medal awarded by the Council of the Royal Geographical Society to Colonel Frémont. In his behalf I thank you, and the gentlemen of the Council and the Society, for an honour which I am sure he will appreciate as one of the most distinguished that has been conferred upon him in his brilliant career.

"This testimonial could not have been given to a more deserving individual. Colonel Frémont possesses in an eminent degree the elements of a just success. He has ability, perseverance, cultivation, and industry; and, above all, he is endowed with high moral attributes, which have won for him the esteem of those more immediately connected with him, and the confidence of his fellow-citizens in the country at large, who will see with pleasure this day's evidence of your correct appreciation of his services to science.

"But I look upon this award of your Council as something more than a tribute to individual worth. I esteem it a national honour; and, as the representative of the United States, I offer you their and my grateful thanks. It is not the least of the charms of science that it is not bounded by the limits of nations. Its influence is as wide as the world; and new discoveries, whether in the field of geographical or other science, are the common property of mankind. Scientific men form a common brotherhood throughout all nations; and the harmony of feeling between them has done much, and is destined to do yet more, towards establishing and maintaining the peace of the world.

"The New has incurred a great debt to the Old World, and particularly to Great Britain, for scientific knowledge. This they hope to repay in some measure at no very distant day. We have made rapid strides in the Union within a few years, and confidently hope soon to contribute our quota to the common stock. Our desire, Mr. President and Gentlemen, is perseveringly to maintain with you a friendly competition, having for its object the advancement of civilization and the elevation of the condition of man throughout the world. And we fervently hope that nothing will occur to prevent this, either by the disturbance of the peace now happily existing between the nations of

Europe, or the cessation of the very friendly feeling between this country and the United States of America."

The President then proceeding, observed—

"GENTLEMEN,—It is now my duty to inform you, that the Council have not considered themselves called upon this year to adjudicate a second gold medal. And here perhaps I may be allowed, on the first occasion of thus addressing you, to express my own opinion, that if you wish to uphold its value as a reward for extraordinary exertions, or for information of the highest value to the objects of this Society, the Council cannot be too cautious in awarding this, the greatest mark of approbation which it is in their power to bestow.

"It has been the practice of my predecessors on various similar occasions, in their annual addresses, to make honourable mention of the names of those individuals who have signalised themselves in the cause of Geographical research and discovery; and I cannot doubt but that such a compliment has had its proper effect, in satisfying many that their exertions have been duly appreciated where they are best understood; and in stimulating others to make new efforts to add to our store of knowledge, and to their own honour. But we are this year called upon especially to mark our sense of the importance of a journey made by the Rev. David Livingston, and his companions, Messrs. Oswell and Murray, in the interior of South Africa, with the object of reaching the large lake of N̄gami; a lake long known to exist, but the true position of which had not yet been accurately determined,—no European traveller having previously reached its shores.

"The earliest Portuguese settlers in South Africa had received accounts of its existence from the natives, and did not hesitate to place it on their first maps of the country. You will find it laid down, and less inaccurately than would be expected, in one bearing date so far back as the year 1508, which is in the collection of the Society. From this curious document, the Lake probably found its way into most of the old maps, till, I suppose from the absence of any new information to corroborate its reality, it was omitted altogether by D'Anville, and those who followed him. Such was the condition of the case until a few years ago, when it was again agitated; and a paper was laid before this Society by Mr. James Macqueen, founded on information regarding it, which, with his customary zeal, he had collected from various sources; and especially from the very individual who has since reached its shores. On these grounds, therefore, without violence of expression, I may say that our explorers have really discovered it, and fixed an important geographical fact. Moreover, it will be in your recollection, that a specimen of the cloth made by the natives of that district, dyed with the wild indigo of the country, together with the enormous tusks of the African wild boar, the flat head of a fish abounding in the Lake, and the fly so dangerous to the cattle and horses of the traveller, were exhibited at one of your evening Meetings; and it has been pronounced that the fish and the fly are unquestionably new.

"Mr. Livingston, it appears, had long had this discovery at heart, when he was, with great liberality, last year provided with the means

necessary to carry out his objects by Messrs. Oswell and Murray, who accompanied him on his journey; and to whose energy and assistance, he acknowledges himself to have been mainly indebted for the successful issue of his undertaking.

"The accounts which have been read to the Society, of Mr. Livingston's journey, comprise not only a positive addition to our acquaintance with South Africa; but, from the statement of this great Lake's being the receptacle of the waters of some large river or rivers running into it from the north, with which we are totally unacquainted, and which are carried off again in an easterly direction by the channel of the Zonga (another river almost equally unknown to us), a prospect of new fields for research and discovery is opened along the courses of those rivers. Indeed the important results of exploring such streams it is impossible to predict; and two travellers connected with this Society, Messrs. Galton and Andeson, have already started in that direction.

"The zealous pastor is in correspondence with the London Missionary Society; to whose kindness—as well as to that of Captain Thomas Steele, one of our own Members—we are indebted for the communication of the first accounts received by them of his expedition. On examining these documents, your Council, in the hope that it may be acceptable, has resolved to address a special letter to Mr. Livingston, expressing their sense of the service he has rendered to Geographical Science, and accompanying it with the remainder of the Royal Premium, which is at their disposal for the present year.

"They trust that the honour of this award out of a royal grant may be some encouragement to him, and to other gentlemen similarly situated, to transmit to the Society any geographical information which they may collect, and which they must have so many opportunities of acquiring in the prosecution of their Missionary labours in the remote and unknown regions which it is their object to explore.

"I propose to address him in the following terms:—

"Royal Geographical Society, May 27, 1850.

"REVEREND SIR,—By desire of the Council of the Royal Geographical Society of London, it is my pleasing duty to acquaint you that your letters to the London Missionary Society, and to Captain Steele, of the Coldstream Guards, containing an account of your having reached, with Messrs. Oswell and Murray, your fellow travellers, the great Lake of Ngami, in latitude 20° 20' south, have been publicly read at one of the evening Meetings of the Society, and will be printed in the forthcoming number of its Journal, together with some further interesting details of the expedition subsequently furnished by a letter from Mr. Oswell, which has also been communicated to this Society.

"The Council have been greatly interested in these accounts, which they cannot but regard as a most valuable addition to our knowledge of the Geography of South Africa; whilst the fact stated of this extensive inland water being but the out-pouring of some large river or rivers from the north, seems to point the way to a vast and entirely fresh region, the exploration of which may lead to weighty consequences. But whatever those results may be, you, Sir, and your enterprising companions, have undoubtedly secured the credit of being the first Europeans who have reached the great Lake of Ngami, and to whom we are indebted for the only positive account of it that yet exists.

"We being therefore desirous, not only to bear our written testimony to the service you have rendered to science, but to mark in a special manner our sense of its importance, have determined to award to you one half of the sum placed this year at our disposal by Her Most Gracious Majesty, as a 'Royal Premium for the Encouragement of Geographical Science and Discovery;' and we have, in consequence, directed the sum of 25 guineas to be placed at your disposal in any way you may direct.

"The Council trust, that while prosecuting your labours in a higher vocation, you will still persevere in your onward scientific course; and heartily wishing you success, I have only further to add, that the Members of this Society will at all times be happy to receive accounts of your future travels, and of the new regions which you will probably be one of the foremost in exploring.

"I have the honour to remain, Rev. Sir,

"Your obedient Servant,

"W. H. SMYTH, *President.*"

The President, then addressing the Rev. Dr. Tidman, Secretary to the London Missionary Society, and Alderman Challis, as representatives of Mr. Livingston, said—

"GENTLEMEN,—Having thus stated the reasons which have guided the Council in their decision upon this occasion, it becomes my grateful office to request you, Mr. Alderman Challis and Dr. Tidman, to convey this testimony of the approval of the Royal Geographical Society to the Rev. David Livingston, with our warmest wishes for the continuance of his health and strength to follow out the discoveries he has thus successfully opened up.

"Geographical discovery in Africa has long commanded, and will ever command, a greater degree of interest than in, perhaps, any other portion of the globe; and with reason: for while it was one of the earliest inhabited portions of the world, and some of its people shone before all other nations in the scientific and industrial arts, it is now the least known and the least civilized of any. Indeed, the intelligent races of Europe have less knowledge of it in the present day than they had two thousand years ago; and ignorance, with debasing and repulsive barbarism, reign almost supreme from one end of that vast peninsula to the other.

"Yet nowhere else has so much been done, or rather attempted, by travellers; a faithful, a zealous, and a sacred band has, for the last hundred years, been proceeding towards that forlorn hope of geography. Though frustrated and baffled, if not actually defeated and destroyed, they steadily kept the prize in view. All the properties and means of men and nature seemed leagued against those adventurous spirits: either a climate peculiarly pestiferous carried them off at once by disease, or arid wastes, of an intensity and extent unknown elsewhere, presented insurmountable obstacles to journeying through or sojourning in the land; while a warlike, and generally an implacable population, from the Arabs in the North to the Caffirs and Bushmans in the South, terminated the career of many whom the elements and sterility of the country had spared. Add to this the very small number of Europeans on any part of that continent, the enormous spaces to be tra-

versed, and the much greater distances from supplies and resources than in any other land, and some idea will be had of the peculiar difficulties besetting the African traveller; and the too powerful reasons which have acted in keeping up, even to the present time, so vast a *terra incognita* as the interior of the ancient land of Ham and of Cush still presents to our view.

"Assure Mr. Livingston, therefore, that we think his researches the more creditable to him, on considering his success where so much is imperatively required to be done: where so many have failed, and so many have fallen.

"And, Gentlemen, I cannot but consider it peculiarly fortunate that you have been commissioned to receive this award, inasmuch as I could not with any justice forbear on such an occasion to allude honourably to the particular Society to which the Rev. Mr. Livingston belongs: for the present signal result is but one of the steps of the beneficent scheme which is carrying out in South Africa, in a spirit of perfect unity, by Missionaries of every European nation.

"It will be needless for me to refer here to the innumerable instances of 'Black Coats,' to use a local but expressive phrase, becoming the pioneers of geographical discovery; of their preceding both the travellers and the traders from the Cape; and of their afterwards smoothing the way for them, civilizing and humanizing, if not always Christianizing, the wild and lawless tribes. But some reference may, with propriety, be made to the great attempt under Dr. Andrew Smith, in 1834. This expedition, the largest and best appointed that ever left Cape Town, had in view the discovery of the long talked of, but still almost fabulous lake in the interior. Having penetrated to Kuruman, the station of the Rev. Mr. Moffatt, he accompanied and carried it through the Zoola country, as far as 23° S. latitude; but that proved to be the utmost distance they could reach, and they were compelled to return.

"The failure of this grand enterprise, as far as the lake was concerned, seemed to dishearten further pursuit; the colonists never ventured again, so that traders and hunters alone have since been wandering on the tracks of the party. The only scientific traveller, Captain Sir James E. Alexander, subsequently sent out from England by this society, in despair of the lake and of discovery by the oft-tried eastern route, explored the neighbourhood of the western coast instead.

"The missionary system, however, was at work the while, noiselessly and securely. The Rev. Robert Moffatt, without the mention of whose name any notice of South African exploration must be incomplete, was still at his post; and he was still blessed with his wonted success in pacifying the hostile, and reforming the ways of the treacherous and rapacious tribes of the interior. Thus acting, he left behind him a quiet and inoffensive people, and pushed northwards to new dangers and persecutions, but finally to triumphs. Joined by other spirits as zealous as himself, the work advanced rapidly, until last year, in the ripeness of time, one of the great cynosures of South African discovery fell an easy capture. The missionaries, following up their own high calling, had so facilitated the traveller's task, that the hour at last

came when the mere subsidy of a moderate amount of money for a small onward movement procured as its result one of those great lakes which had baffled the larger and smaller expeditions of so-called discovery, had eluded the most scientific travellers, and had escaped the grasp of the most adventurous hunters and traders.

"In conclusion, Gentlemen, I cannot but wish success, both spiritual and temporal, to your Society; and long may you possess such members as Messrs. Moffatt and Livingston."

Mr. Alderman Challis replied—

"MR. PRESIDENT,—I beg, in the name of the Directors of the London Missionary Society, to return you and the Council of the Royal Geographical Society our sincere thanks for the distinguished mark of your approbation to our excellent missionary, the Rev. David Livingston, for his interesting discoveries in South Africa.

"Allow me, Sir, also to assure you that it will afford the Directors, in common with the managers of all other missionary institutions, peculiar satisfaction that their agents should in all cases employ both their influence and their exertions to promote the interests of science, and the social no less than the religious improvement of the people among whom they carry on their benevolent labours."

And the Rev. Dr. Tidman, Secretary to the London Missionary Society, observed,—

"MR. PRESIDENT,—Allow me to add a few sentences in reference to the character and qualifications of my excellent friend, the Rev. David Livingston, to whom you have awarded so honourable a testimonial of your respect and approbation. Mr. Livingston possesses many of the most important qualifications for exploring the hitherto terra incognita of South Africa. He is intimately acquainted with the Sechuana language, which appears to be understood by several other tribes and nations to the northward. He is a man of great self-denial and of singular intrepidity, combined with sound discretion. His benevolent character and blameless life make him regarded by the natives as their friend and benefactor; and as a Christian missionary, sustaining this honourable consistency, he travels without fear where the face of a white man has not been seen. I am sure he will feel greatly encouraged by the approval on the part of the Royal Geographical Society of his recent successful enterprise in company with Messrs. Murray and Oswell; and, impelled by a love of geographical science, and the yet higher motives of Christian benevolence, I venture to predict that he will hereafter accomplish yet more important objects in exploring the unknown regions of that vast continent."

After the other proceedings had been completed, and the Officers and Council had been elected, the President proceeded to address the Meeting.

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 27th May, 1850,

BY CAPT. W. H. SMYTH, R.N., K.S.F., F.R.S., &c.
PRESIDENT.

GENTLEMEN,—The ordinary business of the meeting having terminated, I have now to address you on the state and condition of geography in general and in abstract; but as this is the anniversary of the day when you did me the honour of electing me to your chair, I have first, in justice to my own feelings and to your choice of the constituents, to render my acknowledgments to the Vice-Presidents, Secretaries, and Members of the Council, for their uniform attention and support in the discharge of the various duties during the last year.

OBITUARY.

The satisfaction which I experience in thus alluding to their kind assistance has, however, a painful check, in having also to recall to your mind the loss which the Society has sustained in those members—eighteen in number on our home, and three on our foreign list—whom death has snatched from us since our last anniversary. Of these I may cite Mr. William Westall, the artist who accompanied Captain Flinders in his voyage of Australian research; Colonel Alderson, of the Royal Engineers; the Duke of St. Albans; Major-General Cleland, of the Honourable East India Company's Service; and Louis Hayes Petit, Esq., as among our earliest supporters. And there are others who demand especial mention as zealous aiders and abettors of our exertions, or as general labourers in the vineyard of knowledge.

The Right Hon. Sir Charles Vaughan was very conversant with the

history and geography of Spain, a country which he first visited as a traveller and then as a diplomatist; he was subsequently employed as Minister Plenipotentiary to the Swiss cantons, and afterwards as British Envoy to the United States. His last appointment was that of Ambassador to Constantinople, but he did not enter upon its duties, as Lord Ponsonby revoked the application to be relieved from that station. Sir Charles was educated at Oxford, where he became a member of All Souls, of which college he retained a fellowship till his death. Before his arrival at Madrid in the winter of 1808, he had passed some weeks at Saragossa, very soon after the French were compelled to abandon the siege of that town, and had thus an opportunity of collecting on the spot, materials for his interesting account of the heroic resistance of its inhabitants. Some of the gentlemen now present may remember how eagerly this work was read at the time, and the enthusiasm it excited in the Spanish cause.

Mr. Robert Shedden entered the Royal Navy, and served throughout the Chinese war, in which he was severely wounded. He afterwards bought a fine schooner-yacht, called the 'Nancy Dawson,' in which he humanely and intrepidly accompanied the search for Sir John Franklin along the shores of the Arctic coast of America, although it had been his first intention to visit Japan. "Nothing could exceed the kindness of Mr. Shedden," said Captain Kellett, in his Report to the Admiralty, "to those in the boats, in supplying them with everything his vessel could afford, and in following them with considerable risk." He died at Mazatlan, in Mexico, probably in consequence of the severe fatigues he underwent during the voyage.

Admiral Sir William Hotham was one of the first who joined the Geographical Society, remarking that such an establishment had long been wanting. He had a great regard for science, but age and its consequent cares debarred him from an active participation in its pursuits. This officer was educated at Westminster School, from which he entered the navy in 1785, with the estimable Captain Edward Thompson. He served with great distinction in various parts of the globe till December, 1813, when he became a Rear-Admiral, since which time he remained on half-pay till his death.

Admiral Sir Edward William Campbell Rich Owen was a zealous and intelligent supporter of your Society, and was the elder brother of your active member, the present Rear-Admiral William Fitzwilliam Owen, with whose surveys you are well acquainted. Sir Edward entered the navy so far back as the summer of the year 1775; from which time, with few intervals, he was employed in his country's

service for upwards of seventy years, with an activity and decision that are now matters of historic record.

The Rev. Edward Stanley, Doctor of Divinity, Lord Bishop of Norwich, was seized with congestion of the brain, in Scotland, and died on the 8th of September last, in the seventy-first year of his age. In him I have to regret a friend of many years' standing. He had early evinced a predilection for the navy, and very reluctantly entered St. John's College, Cambridge, where he became a wrangler in 1802. He was ardently fond of science, but the particular branch in which his active and inquiring mind excelled, was the study of Natural History; whence he was many years President of the Linnæan Society. He was kind and cheerful in deportment, and possessed, in a remarkable degree, the power of attracting the personal attachment of his numerous acquaintance; nor can his amiable animation at our closing meeting, last June, so shortly before his death, be forgotten by many now present. Another Right Rev. Prelate, Edward Copleston, Bishop of Llandaff, and Dean of St. Paul's, has also been lost to the Society. He was a profound scholar, and very agreeable and instructive in conversation. Besides his '*Prælectiones Academicæ*' and various theological works, he was distinguished in the literary world by his able defence of Oxford (his Alma Mater) against the unsparing attacks of the '*Edinburgh Review*.' I happen to know, personally, that he was well versed in ancient and mediæval geography; and had long been forming a choice library, when he died on the 14th of last October.

Rear-Admiral Sir Samuel John Brooke Pechell, Bart., was one of the first members of this Society. He entered the navy in the year 1796, in the *Pomone* frigate, commanded by his maternal uncle, Sir John Borlase Warren; whence, by successive degrees, he rose to be an officer of distinguished merit and great utility. In his command of the *Cleopatra*, of 36 guns, in the West Indies, he evinced great address and method; and when, in Jan. 1809, he silenced the *Topaze*, a French frigate of the largest class, before his companions could come up, the Commander-in-Chief offered Captain Pechell the command of the prize, as a mark of his approbation, saying to him at the same time, "As you have won her, you shall wear her." He was very attentive to the state of the charts while cruising, but his graver attention was bent upon Naval Gunnery, upon which he published some very useful pamphlets, one of which, entitled '*Observations upon the Fitting of Guns on board His Majesty's Ships*,' went through three editions. Sir Samuel had long suffered from gout, and died in London on the 3rd of last November.

Commander James Wolfe entered the Navy in the summer of 1814, and joined Her Majesty's ship *Adventure*, under my command, early in 1821, at the earnest recommendation of Captain Sandilands, of the *Morgiana*, in which vessel he had been serving on the coast of Africa. I found him ready, obedient, and pains-taking, and therefore assigned plenty of employment for his exertions. He attained the rank of Lieutenant in 1829; and nearly from that time to the day of his death, 29th of last November, has been actively employed in the survey of various coasts and harbours. For his merits in this department he was made a Commander in 1843, and appointed to continue his examinations of the Irish shores. Various charts and plans of his station have been published by the Hydrographical Office, of which the principal are, the River Shannon from the entrance up to Limerick, on seven double elephant sheets; Upper and Lower Lough Erne, Bantry Bay, Bear Haven, and the Cove of Cork. Besides these, there is now in hand and will be soon published, the South Coast of Ireland from Cork to Bantry Bay, on seven or eight large sheets, probably the most complete of Commander Wolfe's surveys.

Mr. Edward Doubleday, a distinguished naturalist, with some taste for geography, died on the 14th of last December, of a very painful complaint in the spinal process, at the early age of thirty-nine. He was assistant in the zoological department at the British Museum; and his labours in the classification and delineation of insects were of critical accuracy, as shown in his work on '*Diurnal Lepidoptera*,' now interrupted by his death. He is regretted likewise as the able Secretary of the Entomological Society, a testimony of no small character to his habits of method and application; and his general knowledge in literature was very extensive. In memory of his zeal, it may be recollected that, before his being appointed to the Museum, he visited the United States, to collect specimens in all branches of natural history; and that he wished to accompany the ill-fated Niger expedition as naturalist.

Henry John George Herbert, Earl of Carnarvon, was educated at Eton, and Christ-Church, Oxford, where he took his degree. In spite of delicate health, he was an assiduous traveller. In 1822, in company with Mr. Pusey, his brother-in-law, he made an extensive tour in Spain, which led to the publication of his well-written poem, called *The Moor*, in 1825. Two years afterwards, Lord Carnarvon resumed his Peninsular travels; and the stirring personal adventures he was involved in are detailed in his '*Description of Portugal and Galicia*,' an attractive narrative, which has passed through three editions. In

1838, he resumed his travels, making an extensive tour in the Levant; and it is much to be regretted that illness prevented the intended completion of his journal for public view, more especially as he had found a very singular state of society to exist among the Malmotes. This accomplished and virtuous nobleman died, after a lingering illness, in Berkshire, on the 10th of last December, in the fiftieth year of his age.

The Foreign Members, whose loss from our ranks we have to deplore, are Colonel Forsell, the distinguished Swedish statist; Cavaliere Adriano Balbi, of Venice; and M. Edward Biot, of Paris. The Cavaliere's son, M. Eugène Balbi, has sent us a lithographed portrait of his father, and a copy of the first part of his '*New Compendium of Geography*,' the publication of which is to be completed in the course of the present year. The death of M. Biot was communicated to me on the 25th of March, by his celebrated father, Jean-Baptiste, so respected in our scientific circles, in these terms:—

"I have the grief to inform you that I have just lost my son, Edward Constantine Biot, Member of the Institute (Academy of Inscriptions and Belles Lettres), whom your learned Society honoured by placing on your list of Corresponding Members.

"He died on the 13th of March, 1850, aged 47, having been born the 2nd of July, 1803. Besides the works and memoirs which he had before published, of which I shall soon have the honour of sending you a complete list, he was occupied, when death struck him, in printing a translation of *Tcheou-li*, in two volumes 8vo., accompanied by numerous extracts from the best Chinese commentators. His labour will not be lost—the printing of his first volume, and of part of the second, being completed at his death; and we have found among his manuscripts all the remainder of his translation of the text, also the general and particular tables of the entire work, as well as the historical and critical dissertation that is to serve as an introduction. The learned Chinese scholar, M. Stanislaus Julien, whose disciple he was, has had the goodness to undertake the whole publication, thus continuing to his pupil beyond the grave, that interest and affection which he granted him during life."

OUR OWN "LABOURS."

In now turning to a retrospect of our proceedings during the past year, I cannot but congratulate you upon the satisfactory Annual Report which you have this day received from your Council, since it strongly exhibits the elements of stability. That a depression had taken place in your financial concerns is not at all surprising, when the efforts and offerings of so young an association are considered. The Report has quoted the statement I made to the prime minister, Lord

John Russell, on the subject; and to that statement I can safely add, that I am not aware of any one of the scientific bodies of London having made so great an effort in a similar time, by publications and money-grants, to forward the special branch of knowledge for which it has been especially associated.

During the present session of the Society we have had many very valuable communications at our meetings, from all quarters of the globe; and few of those evenings have passed without some instructive discussion, or verbal comment, in illustration of the papers read. Our collections of books and maps have been largely augmented by valuable donations; and they are gradually gaining the most proper condition and arrangement for effective usefulness.

Without at all impinging on the interest of those papers which are to appear in your Journal, I may be allowed to catch a Parthian glance at those which were read at our last year's evening meetings.

Sir Gardner Wilkinson, perhaps the best authority upon the actual condition of Egypt, sent us his remarks on the country between Wady Halfeh and Gebel Berkel, in Ethiopia, with some observations on the level of the Nile. This is a field which Sir Gardner, from having long and successfully made it his peculiar study, is well qualified to reason upon; and he accordingly treats its geology, botany, and topography with a masterly hand; but the measurements, taken with the aneroid barometer, may require repetition and confirmation. We have since received a paper containing notes on Central Africa and the Upper Nile, by Baron Von Müller, the Austrian Consul-General in that region; a gentleman who purposes to continue his researches there, to which I shall presently allude.

During this period, our African intelligence has been unusually varied. The interesting and welcome account of the discovery of Lake Ngami was followed by Mr. Macqueen's communication on the geography of South Africa, a letter from Colonel Napier on the same subject, and the exhibition of a series of beautiful views and illustrations in Abyssinia, by Mr. Bernatz. Mr. Macqueen has also exerted himself in procuring the best notices of Eastern Africa; and Colonel J. A. Lloyd has supplied us with a description of Madagascar, in which there is some new information respecting the geography and inhabitants of that great and important island.

But I regret to say that on the west of this continent we have lost our able pioneer, Mr. John Duncan, who died on board her Majesty's ship *Kingfisher*, in the Bight of Benin, on his way to Whydah, having been appointed Vice-Consul for the British Government at

Dahomey. Mr. Duncan had served in the Life Guards; but being imbued with an ardent thirst for African discovery, procured an appointment as armourer in the Niger expedition, to which, in the time of distress and mortality, he rendered effective service. He subsequently, under the direction of this Society, explored a great tract of country between the rivers Lagos and Niger, never before visited by any European, in which, though uneducated, his observant mind and prudent conduct produced useful results, especially in the moral views he brought forward.

Your Honorary Secretary, Mr. Hogg, presented us with a paper on Abila and the Tetrarchy of Abilene, near Mount Lebanon, which does equal honour to his learning and his perseverance; and as he has brought together a great mass of matter in illustration of that subject, it will probably be considered as setting at rest the question respecting the actual position of these places. This was followed by some notes on the physical geography of Palestine, by Colonel Von Wildenbruch, which, though of some interest in itself, left undetermined the peculiar conditions of that very singular depression of surface, which induced the ancients to designate the whole earthquake-shaken area "*Cœle-Syria*."

From the northern, and hitherto nearly unexplored, parts of Arabia, we have some singularly valuable details communicated by Dr. Wallin, a Finnish gentleman, who has so completely made himself master of the language, manners, and customs of Arabia, that he is perhaps the best qualified traveller for exploring in that country now living. Indeed I cannot do better than quote the emphatic words of Major Rawlinson, whose authority none will dispute:—"Looking," said he, "to the qualifications of travellers for Arabian discovery, there are two names, and two names only, which stand out in very bright relief. Those names (I must be excused for associating them) are Burekhardt and Wallin. I see many points of resemblance between them, the same iron constitution, the same versatility, the same indomitable energy, the same imperturbable temper." Major Rawlinson made Dr. Wallin's acquaintance on the banks of the Tigris, and described him to me as having so completely mastered the idiom, enunciation, and minutest peculiarities of the language of the Arabs, as to be truly a Bedouin. While on these regions, I cannot omit to recall to you the obligation we are under to Major Rawlinson himself, for the learned and lucid description of Babylonia, which he so obligingly recited to us at our last meeting.

We have received and read the account of a fourth entrance from

Sikkim into Thibet, by means of the Donkiah pass, by Dr. Hooker; and a letter from his excellent father, Sir Wm. Jackson Hooker, describes the recent capture and subsequent release of his son and Dr. Campbell, by the Rajah of Sikkim.

Dr. Gutzlaff, lately elected a Corresponding Member of this Society, has very kindly made us some graphic communications respecting China and Japan; the first confirmed by his own personal experience, and the second by strict and methodized inquiry. We also had an account of a late visit to Japan, by Commander Mathison, in her Majesty's ship *Mariner*, which contains detailed information as to the ports and places he visited, the people he met with, and the exclusive principles of their government.

From Dr. Bigsby—one of our members, and late Secretary to the Boundary Commission—we have received notes on the route from Lake Superior to Rainy Lake; and he has furnished the library with his work entitled '*Pictures of Travel in the Canadas*,' giving some new notices of the Highlands below Quebec, and of the Lakes, with numerous plates and maps. Mr. William Bollaert, another member of this Society, read a description of the Geography of Texas, as observed by himself. This paper was replete with interest; and accompanied by geological sections, which combined much physical detail, leaving very little doubt as to the structure of that extensive state. Reports on the Coal Formation in the Straits of Magellan, from Captain Henderson, R.N., and Commander Paynter, and another on the Discovery of Coal near Erzeroom, in Asia Minor, were also received and read.

From Australia we have had some detached communications, of which one treated of an expedition from Perth to Russell Range, on the south-western parts, by Surveyor-General Roe. It is, however, with regret I state that nothing authentic has yet been heard concerning the long-absent and adventurous Leichhardt. The last advices still bear date, Coochin, 3rd of April, 1848. The report of his having retraced his steps for a considerable distance, to the nearest station, with the intelligence of his having discovered a vast and fertile tract beyond, has not been confirmed officially. But the fate of another expedition in those regions, is unfortunately divested of all uncertainty; for Earl Grey communicated to us the Governor's dispatch, enclosing the documents relating to the murder of that experienced explorer, Mr. E. B. Kennedy. These, as you will remember, consisted of the Journal of Mr. William Carron, botanist to the expedition, some examinations, and the unaffected but touching narrative of Jackey-Jackey, his faithful native servant.

We have also had Mr. Thomas Brunner's 'Journal of an Expedition to explore the Interior of the Middle Island of New Zealand;' in the course of which several interesting discoveries were made. This is a plainly-told story of 550 days' sojourn in a rugged and wild country, almost without inhabitants, and nearly destitute of vegetation. The party endured great fatigue and privation; and the description holds out but little to tempt the settling emigrant.

You will not have forgotten Mr. Saxe Bannister's proposal for the construction of Maps upon the walls of the corridors and committee-rooms of the new Houses of Parliament; nor the elaborate remarks thereupon by your excellent Vice-President, Mr. Greenough, the object of which, he said, was "rather to enunciate a principle, than to lay down a system." Mr. Bannister has since published a pamphlet on Pictorial Maps for the illustration of the land, the sea, and the heavens on the walls of extensive buildings; and he suggests the newly-constructed large concave globes, called georamas, for the purpose of giving geographical lectures in. The maps proposed are such as those which Gregory the Great introduced into the Vatican; and such as that constructed by Sebastian Cabot, of Bristol, long exhibited in the gallery of the Royal Palace at Whitehall. But Mr. Greenough, while favourable to the principle, would prefer a series of entirely new cartographic compositions, to any copy whatever.

EUROPE.

In presenting to you a rapid outline of the existing state of geographical inquiry in general, I have to remark that though from the wide spread nature of the conditions of the question there will of course be many a hiatus in point of circumstance, I hope that the kindness of my correspondents has enabled me to give a tolerable sketch in substance. And in thus glancing around the globe, albeit I shall not exactly step *pari passu* in the track of my worthy predecessor, I purpose keeping to the form in which his address was delivered at our last anniversary; a form introduced into this Society by his learned and esteemed father; in continuing which I endeavour to render more durable and imperative a practice, that must inevitably be deemed useful.

It has been usual to commence with the state of the survey of our own coasts—and the extent and value of those labours really have a particular claim to your notice, as well from the utility of the results as from the talents and industry employed. Last year Captain Sheringham was represented as extending his work westward from the Isle of Wight; and we learn that he is now actively surveying the vicinity

and dangers of St. Alban's Head. Captain Bullock is continuing his examination of the coast from the entrance of the Thames to New-haven; Commander Otter is employed on the N.W. coast of Scotland and the Hebrides; and Captain Robinson is stationed on the W. coast of Scotland, from the Mull of Cantyre to the northward. Captain Beechey is still investigating the tidal phenomena of the Bristol Channel and the mouth of the Severn—in which he has already displayed both tact and judgment; and Commander Williams is exploring the coast of Cornwall; while Ireland is under the examination of Commanders Frazer, Bedford, and Beechey.

These are the Home Surveys, advancing under the very able superintendence of Sir Francis Beaufort—one of the earliest, warmest, and most steady friends of this Society. The Hydrographical Office, over which he so admirably presides, has, in the same interim, published no fewer than 92 valuable charts and plans, besides books and tables, to the great advantage of navigation and commerce. These will be found in your archives; and it may therefore suffice here to say, that they delineate portions of England, Scotland, the Azores, North and South America, the Arctic regions, the Archipelago, China, and Australia.

The Government Survey is steadily advancing northwards, the northern portion of Lancashire and the west of Yorkshire being now in the course of engraving. The Marquis of Anglesey, Master-General of the Ordnance, has supplied us with this great work as it proceeds; and he has, moreover, kindly permitted me to bring under your notice the creditable efforts that have been made towards a map of the country around the eastern frontier of the Cape of Good Hope Colony. But this compilation, collected as it has been from various authorities, can at present only be received as an approximation to the geography of that district—useful, as all early maps of new settlements are, for general location—but such as will certainly require adjustment or verification, as the country becomes more known.

The Ordnance Trigonometrical Survey led the way to the indispensable physical inquiries which accurate maps on a large scale opened out; and the Geological survey of Great Britain and Ireland has been a happy consequence. This survey claims the zeal and special knowledge of eminently qualified men, who at once can render service to science, to the mining interests, and to the arts and manufactures. The corps continues under the direction of the indefatigable Sir Henry De la Beche, one of our members; and the survey is already making as rapid a progress as can be expected from the limited number of individuals engaged in the field; and the peculiar nature of the country

examined. The northern counties of Wales have, in particular, occasioned a protracted study; of the complicated relations of which, excepting the labours of Professor Sedgwick, scarcely any description had hitherto appeared on whose accuracy reliance could be placed. The mountainous and broken character of the surface, with a continually recurring interference of igneous rocks, both eruptive and contemporaneous, have greatly increased the intricacy of the mapping. It is, however, expected that within a few months the whole of the Principality will be completed.

The valuable mineral districts of Flintshire and Denbighshire are ready for publication; and portions of Dorsetshire, Hampshire, and the South Staffordshire coal-district are in a forward state. In Ireland the counties of Dublin, Wicklow, Kildare, and Carlow have been surveyed, and their index-maps geologically coloured; and the whole is creditable both to the employers and employed. As the subject, I believe, has not been mentioned to you before, I may inform you that the party at work in the field, under Sir Henry De la Beche, are as follows:—Professor Ramsay, director; with Messrs. Bristow, Jukes, Aveline, Selwyn, and Trimmer, as geologists; Professor Forbes as the palæontologist; Mr. Warrington Smyth, the mining-geologist; and Dr. Hooker as the botanist. In Ireland, Professor Oldham, the director, is assisted by Messrs. Wilson, Wyley, and Dunoyer.

The burins of our practical geographers have been at work, and many maps and plans have been published during the year. Of the more important, Mr. Arrowsmith has compiled a map of British Kaffraria from a military survey, on a scale of two miles to the inch—a map of New Zealand, laboriously constructed from all the existing documents—Canada, New Brunswick, Nova Scotia, &c., on eight elephant sheets, and 16 miles to one inch—Eastern and Western Australia—the Island of Madagascar, from information communicated by Colonel Lloyd—and others of less note. Our Member, Mr. Wyld, has recently brought out a map of Hungary, and is occupied upon one of the Island of Borneo; he has also produced a large plan of London and its environs, which I shall have occasion to allude to presently. Mr. Petermann, another of our Members, has been diligently employed: his two beautiful physico-statistical maps of the British Isles, so favourably announced from this chair last year, have been published. Mr. Petermann's *Physical Atlas*, the descriptive text of which is given by our fellow Member, the Rev. Thomas Milner, contains 15 maps, and a chart of the distribution of animal and vegetable life in ascending regions, besides other novel features.

When we consider that every good compiler studies and patiently compares the materials, often very discordant, wherewith he constructs a map for which he is in a degree responsible, the nature of these labours will be appreciated.

If an assumption may be hazarded from the state of the public press, the practice of which is seldom to administer a supply but on demand, the votaries of geography must be on the increase; for not only have we the usual number of narratives of voyages, travels, and explorations, but there is also an unusual proportion of statistical, political, and physical information. Among these, no fewer than four Gazetteers, of a very superior description, have been advertised; and the specimens which I have examined go far to prove that neither industry nor expense will be spared in completing them. The earliest to be finished will probably be the 'Complete Geographical Dictionary,' by Mr. A. K. Johnston, of Edinburgh, (the efficient editor of the well known 'Physical Atlas,') which, after years of severe labour, he expects will very shortly make its appearance: it is to contain 46,404 entries of places. In February last, the first part of the 'Imperial Cyclopædia of Geography' was published by Mr. Charles Knight. It is professedly intended to accompany the maps published by the Society for the Diffusion of Useful Knowledge, and is to form four volumes, royal 8vo. Messrs. Blackie and Son have issued a prospectus of a General Gazetteer, to contain about 25,000 names, in which a profusion of small illustrative woodcuts will constitute a prominent feature. The last is of still higher pretension, and if carried out according to the promises of its prospectus, will be most comprehensively useful, containing the names of 100,000 places: it is edited by a Member of our Society, and published by A. Fullarton and Co., of Edinburgh.

But among the many publications of the year I must select one which, though only a new edition, is entitled to a high place in your regard, because, on its being first launched, you discerned its merit, and awarded the Gold Medal as a mark of your approbation. I allude, Gentlemen, to the third edition of that truly useful work, Lieut. Raper's 'Practice of Navigation and Nautical Astronomy;' a work in which the capacity, systematic method, and intelligence of the author are so strikingly evident. The book is greatly augmented in matter since its original appearance, but, from the excellence of its printing, it has not grown much in bulk; and the additions are such as to increase its utility. The most operose and remarkable feature of this edition, however, is the 'Table of Geographical Positions,' discussed and methodized upon a chronometric system, now consisting of no fewer than 8,800 points,

instead of the 2300 it first placed before us. From its bearing not only, as usual, the latitudes and longitudes of places, but also the dimensions of islands, state of anchorages, peculiarities of lights and lighthouses, depths of shoals, and other necessary details, I may fearlessly pronounce it to be the most accurate and comprehensive representation of the present state of maritime geography, extant. To accomplish this, the author has devised a series of very significant symbols, and applied them to the expression of many important matters; indicating by their means watering-places, dangers, the character of the natives as friendly or hostile; the presence or absence of trees or bushes—whether as a means of identification, or as marking places where firewood is to be found—and distinguishing more especially the *cocos nucifera*, which, on account of its conspicuous form, and its affording both food and beverage, is an object of peculiar interest to the tropical navigator. By such symbols this table is made to contain, with scarcely any increase of size, a vast quantity of varied information: while the signs themselves, being founded on obvious or natural considerations, are easily acquired and retained. The author, in justifying the introduction of a scheme which a few years ago might have been considered a rash, if not a dangerous innovation, concludes his remarks by saying:—"The employment of symbols, therefore, on a more extensive scale than we have yet been used to, and that at no distant period, may be considered inevitable; and the present system, which has occupied my attention for several years, is proposed as so far deserving consideration, that it is constructed with rigid adherence to principles."

This is important to the ends of tangible geography, as well in the construction and arrangement of tables, as in every description of cartographic composition. In a work of my own, which may one day be brought to light, I shall assuredly adopt Lieut. Raper's symbols in tabulating the results of observations; and I notice that Lieut. Maury, of the United States Navy, has greatly extended the use of such signs in his important Wind-and-Current Chart of the Atlantic Ocean. The imperative task in the question is, so to conventionalize the matter, that, as with music, the forms may be read and understood by people of all nations.

In now looking away from our own shores to the rest of Europe, the advance of geographical exertion during the past year, or even for a longer period, appears to have been less striking than usual. Although science belongs to no party, and acknowledges no politics, it is not amid the turmoils and excitements of social changes, and a rupture of

the established order and ties of society, that we can fairly expect knowledge to make an onward progress.

France, however, is busily at work, although she has exhibited but little substantially new in geography during the last few months; yet, taking advantage of the facilities afforded by her possession of Algeria, several expeditions for the interior of Africa have been discussed and planned. Last January M. Rochet d'Héricourt read a paper to the Geographical Society of Paris, on the constant rising of the land in the Arabian Gulf and Abyssinia; and my predecessors have already told you his capacity for making such observations. A new and daring project of a tour in Central Africa, by Colonel Ducouret, having been entertained, the Minister of Public Instruction applied last year to the Academy of Sciences to give hints for his guidance. In consequence, that body recommended further researches on the various palms yielding the spirituous *'arâk*, and on the inebriating lotus, called *damûk* by the Arabs; also on their edible, medicinal, and tinctorial plants. In publishing such instructions, our neighbours become useful to all travellers, than whom no class should be holden in a more cosmopolitic character. Several works of geographical note have issued from the French press, of which I ought to mention the '*Voyage of the Astrolabe and Zélée to the Southern Ocean, from the year 1837 to 1840,*' conducted by the late lamented Dumont d'Urville. This work is in great part published, and will consist of thirty-four volumes, with 520 plates, classed according to various branches of science.

Of the several recent scientific appointments in France, I cannot but congratulate you on that of Admiral Matthieu to the directorship of the *Dépôt Général de la Marine*, or, in other words, the Hydrographical Office at Paris. I do this with the greater confidence, since I am personally aware of his sterling qualifications for that eminently useful station, having been acquainted with him from the year 1816, when he was serving with my friend Capt. Guattier in the Mediterranean. In him there will be no want of reciprocity in communication, or in forwarding to us the most recent publications of his bureau.

This allusion to the Mediterranean leads me to remind you that the survey of the Archipelago is advancing towards its completion, the force under Capt. Thomas Graves being now employed on Candia and the other southern islands. In contemplating the surveys of this officer already published—surveys equally capable of meeting the wants of the geographer, the navigator, the scholar, and the traveller—I cannot but feel great gratification, inasmuch as Capt. Graves com-

menced his surveying career with me as a Midshipman in H.M.S. "Adventure;" and I am, moreover, proud that five other officers who served under me in the same ship, are recorded on your pages as useful members of this Society. These officers are Capt. Beechey, Lieut. Raper, and Commander Miles; and the late Commanders Slater and Wolfe.

The south of Europe has not as yet attained sufficient repose to have made much, if any, advance upon the works already reported to you, except that the '*Diccionario Geografico de España*' of Don Pasqual Madoz is completed. But the Germans, though so violently disturbed, have produced some important geographical publications during the past year. In Prussia, two maps are in course of completion—the province of Brandenburg, on a scale of $\frac{1}{100,000}$ (about $1\frac{1}{2}$ mile to an inch), of which the sections, 26 to 34, have been published; and a map of Westphalia, on a scale of $\frac{1}{100,000}$ (about $1\frac{1}{2}$ mile to an inch), of which sections 46, 47, and 48 are completed. There are also twenty sheets of Reymann's large map of Germany published within the last year, on a scale equal to $\frac{1}{300,000}$, or about 3 miles to an inch.

Among the many publications, the appearance of which must be ascribed to the political state of Germany in recent days, are the various ethnographical maps, particularly those of the Austrian Empire; and that by R. A. Fröhlich, showing the nationalities and languages of that empire, is probably the best.

Professor Berghaus has commenced the publication of a second edition of his great Physical Atlas, arranged in eight divisions, according to the different subjects, each to be complete in itself. No. 1 of these divisions is published, and comprises Meteorology and Climatology. The second part, Hydrography, is nearly ready; and the other six—Geology, Terrestrial Magnetism, Botanical Geography, Anthropology, and Ethnology—will follow in quick succession. In this undertaking will be embodied the researches and discoveries which have been made during the last ten years. Besides this, the indefatigable Professor has published as a supplement to his atlas, a periodical bearing the name of 'Geographical Annals' (*Jahrbücher*).

Professor Dove, whose labours are so generally known, has constructed a set of thermal maps of the globe, which form, as far as I can pronounce, a beneficial Hygæan addition to terrestrial physics. His admirable tables of the temperature of about 900 places, have been published in the Transactions of the Berlin Academy of Sciences, as well as in the two last Reports of the British Association for the Advancement of Science. From these materials he has now drawn

isothermal lines over the whole surface of the earth, for every month of the year.

But among the gifts for which we are indebted to German skill and perseverance, is also the valuable contribution made to Cartography in the shape of a critical catalogue, or perhaps more appropriately a review (*Beurtheilende Uebersicht*) of all the most important maps and plans of Europe. This book is arranged according to the different states, giving the title, extent, number of sheets, scale, date of survey, year of publication, and respective prices, with condensed notices from competent authority. The first volume is now published, and comprises central Europe; but as it is printed from transfers written in the German character, its use will be comparatively circumscribed until it shall appear in an English or French dress.

With the Danes, Geography has never been idle since the surveys of Löwenhorn and the writings of Malte-Brun; for notwithstanding that the latter was an exile, his works were exceedingly popular. A great impulse was given to all branches of inquiry, when the late king, Christian VIII., although an absolute monarch, still retained his place as President of the Academy of Sciences, to which he had been before elected: and I may be permitted, in thus mentioning him, to record my own conviction of his cultivated mind and amiable disposition, from much personal intercourse with him in 1820, when Crown-Prince. Mainly by his influence, the *Galathea* corvette was fitted for a voyage round the world, under the command of Commodore Steen Bille. This ship, it will be remembered, left Copenhagen in June, 1845, visited India, China, and the Sandwich Islands, touched at Valparaiso, rounded Cape Horn, and returned in August, 1847, with a considerable harvest of scientific observations and collections. The first volume of this voyage was published in the last year, and will soon be followed by the rest: the main object of the expedition was the survey and colonization of the Nicobar Islands, belonging to Denmark.

The hydrographical surveys of the entrance of the Cattegat, and of the Great Belt, have been completed; but the recent war with Prussia has delayed the contemplated examination of the west coast of Iceland, and other important works. However, the large map of this interesting island has been completed, and a copy has been promptly forwarded to us from Copenhagen. It is on four sheets, upon a scale of $\frac{1}{100,000}$, and is highly creditable to the late Colonel Olsen, the superintendent; Professor Gunnlaugsson, the draughtsman; and Messrs. Scheel and Frisak, who conducted the triangulation. This is, without doubt, the most important contribution to the exposition of the natural condition

of Iceland that has yet appeared ; and therefore it is that I may dwell a moment longer on it than I would upon works of a more common order. All the prominent natural features appear with great distinctness ; and by a peculiar hatching and tinting, the lava currents, heaths, moors, swamps, and other peculiarities of surface, are well shown, among which are those enormous masses of ice (*Jökler*), of more than 200 square miles each, in different parts of the country. This really beautiful map is founded upon the Government surveys executed at the commencement of the present century, the elements of which have been subjected to a new and careful recalculation. It is accompanied by an index-map on one sheet. An excellent work upon Iceland, by Dr. Schleissner, published by command of the Danish government, and presented to us by its talented author, ought also to be mentioned.

I regret my inability to say much as to the progress of science in Russia, except that I know it to be in a state of spirited advancement ; and that there are eminent travellers on its eastern boundaries. Thus the *Comptes Rendus* for July, 1849, notice a memoir by M. Tchihatcheff, on the high land in Tartary, where the great rivers anciently known as the Oxus and Jaxartes take their rise, and which he tracked through their devious courses into Lake Aral : and the celebrated Leopold Von Buch—*clarum et venerabile nomen*—has informed us, that M. Abich has made numerous discoveries and determined the heights of various mountains in Caucasus and in Persia, in one of which he “discovered perpetual fire at the height of 6000 feet.” Still I am without exact information upon these very interesting topics.

From a correspondence which I have had with Professor Struve, the illustrious astronomer of Pulkova—the most munificently endowed Observatory in the world—I was in hopes of giving you an account of the great geographical measurements carrying on under his supervision ; but at present it is not in my power. And although it has been communicated by our foreign associate, Admiral Lütke, to Sir Roderick Murchison, that the Imperial Geographical Society of St. Petersburg has been completely successful in its efforts to develop the features of that wild and hitherto untrodden region, the North Ural Mountains, and that the newspapers announce that Colonel Hofmann, the leader of the expedition, has been honoured with the medal of the president, the Grand-Duke Constantine, we have not yet received either the work or the maps.

But, Gentlemen, I trust that before I again address you, some of our valued honorary Russian Members will further respond to my appeal,

and furnish materials to enable me to indicate the general progress of geographical research within their vast empire. And at our next anniversary, I hope also to be able to show you how much a Geographical Society like that of St. Petersburg, founded only three years ago on the model of our own, has already effected, backed up as it is by the munificence of an enlightened Emperor. In this constitutional country, our beloved Sovereign and Patron can do no more than offer a high example, by enabling us to confer a Royal gold medal annually on a good labourer in our field; but as an old geographer, I cannot refrain from expressing some degree of regret and disappointment, that our public men do not *yet* seem sufficiently to feel the desirableness of bestowing pecuniary support on a body like the Royal Geographical Society of London; a body which is substantially executing works of utility to the British nation, as well as to the rest of Europe. I say that public men have not *yet* felt as we do; for knowing that our cause is just and noble, I have an impression that, before we next meet, I may have agreeable news to communicate on this subject, to us of such vital importance.

From Russia we cannot but extend our glance towards the Arctic Regions, under feelings of the most painful embarrassment. There is still a hope glimmering through the gloomy uncertainty which hangs over the fate of the enterprising Sir John Franklin and his gallant companions, although they have been five years absent in those inhospitable seas. In the high excitement of the public mind, it may be necessary for me to state the present knowledge we possess of the case, and the actual means now in hand for their deliverance.

The efforts of Sir James Ross, though limited by adverse circumstances to a much smaller portion of the Arctic Seas than was expected, yet prove that the missing expedition must have succeeded in attaining a westerly longitude but little short of Melville Island, if they are safe. For, as Sir James was stationed for several months at the junction of the four great channels—Barrow Strait, Lancaster Sound, Regent Inlet, and Wellington Channel—it is extremely improbable that Sir John Franklin's ships can have been near the opening to those straits, without effecting a communication with those who so anxiously sought him. The dispatches recently received from Commander Pullen, who has achieved the adventurous voyage from Wainwright Inlet to the Mackenzie, in open boats, inform us that no traces of the expedition were met with on the American coast between those two places, nor had the Esquimaux with whom our people communicated, seen anything of ships or men.

A dispatch from Dr. Rae, which accompanies that from Commander Pullen, is equally barren of intelligence. Dr. Rae, as you may remember, was ordered to proceed from his winter quarters at Fort Confidence, on Great Bear Lake, to Cape Krusenstern, and crossing from thence to Wollaston Land, he was instructed to penetrate to the north-east of Banks's Land. He accomplished the journey to Cape Krusenstern; but all his attempts—and they were numerous and daring—to effect the traverse to Wollaston Land, were baffled by the heavy pack of ice which entirely barred the progress of his boat. Having waited in hopes of a change, as long as he could, taking into consideration the imperative necessity of returning before the closing up of the Coppermine-river, he was reluctantly compelled to abandon the enterprise. During his sojourn at Cape Krusenstern, the Esquimaux interpreter, who accompanied him, fell in with several parties of natives, who all agreed in declaring that they had not seen any white men. We may therefore take it for granted that none of Sir John Franklin's party have struck the North American coast, because the entire extent between Cape Krusenstern and Behring's Strait has been diligently examined by the strenuous and enduring exertions of Sir John Richardson, Commander Pullen, and Dr. Rae.

Although the Behring's Strait expedition, consisting of Her Majesty's ships *Herald* and *Plover*, Captain Kellett and Commander Moore, procured no tidings of the missing, yet the details of their endeavours are highly interesting. On the 15th of last August, the *Herald* had attained the latitude of $71^{\circ} 12' N.$, and long. $170^{\circ} 10' W.$; and on the 16th, discovered an almost inaccessible island of granite, rising 1400 feet above the sea, beyond which a range of high land was seen. "It becomes a nervous thing," says Captain Kellett, "to report a discovery of land in these regions without actually landing on it, after the unfortunate mistake to the southward; but as far as a man can be certain, who has 130 pair of eyes to assist him, and all agreeing, I am certain we have discovered an extensive land." They contrived, though with great difficulty, to get upon the island, hoist the Union-jack, and take possession of it in Her Majesty's name; but constant snow-storms compelled them to quit the neighbourhood, and insure clearing the ice-pack. Now it will be recollected that Serjeant Andreyev, the active Russian who conducted an expedition of discovery in the Icy Sea, in 1762, affirmed that he had reached a country called Tikigen, having a coast-line trending nearly parallel to that of Northern Siberia, and inhabited by a race named Kraihai. This account was held to be apocryphal by most geographers, and imputed to

an optical delusion by Baron von Wrangel: yet the narrative of Captain Kellett goes far to corroborate Andreyev's statement. Even the high land descried by von Wrangel himself from Yakan, may, it is not too much to say, have formed some portion of the disputed region: and besides the discoveries of Captain Kellett, elevated peaks, which may reasonably be concluded to be a part of the same land, were observed by Commander Moore, whose track lay further eastward than that of the *Herald*. Now, putting these circumstances in conjunction, it is far from improbable that a continuous coast-line may extend from the vicinity of New Siberia in the west, to the vicinity of Banks's Land in the east. In the event of such an hypothesis proving correct, it will be obvious that, should Franklin have succeeded in penetrating through, and to the west of Wellington Channel, the interposition of this tract would preclude all possibility of his bringing his ships again so far south as to reach Behring's Strait, unless the course were greatly prolonged westwards, or the Wellington Channel were again traversed. I may here remark how cautious, as well as delicate, closet inquiry ought to be in meddling with the direct assertions of explorers: indeed, the signal instance of Baffin's Bay having been formally expunged from our charts, and branded as "wholly supposititious," ought not to be forgotten by imaginative theorists.

The negative information hitherto obtained, renders it the more probable that our unfortunate countrymen—if still in being—are frozen up in the neighbourhood of Melville Island; and a hope is thereby warranted, that one of the numerous expeditions sent out this year may succeed in succouring them. Two have already sailed to Lancaster Sound, under the orders of Captain Horatio Austin, and Captain Penny, who lately commanded the *Advice*, whaler. The exertions of the former will be mainly directed to penetrate to Cape Walker and Melville Island; while the latter will proceed direct to the entrance of Jones's Sound, up which he will sail and explore it as far as possible. These expeditions are equipped in the most complete manner; and that of Captain Austin is provided with highly effective auxiliary steam-power. In fact, I was satisfied on visiting the *Resolute* before her departure, in company with Sir George Back, who has had such full experience in the Polar Seas, that human ingenuity was never more fully displayed than in the strengthening, stowage, and equipment of this ship.

Under the patronage of the Hudson's Bay Company, aided by a public subscription, a small expedition, headed by the veteran Sir John Ross, will proceed in the same direction as that of Captain Austin;

and as none of these plans provide for the search of Regent's Inlet, exertions are making to organise a private outfit, to be conducted by Commander Forsyth, for this special purpose. These expeditions, numbering eight ships,—exclusive of the *North Star*, already there,—will effectually explore the channels and passages east of Melville Island : and it is to be hoped, that the Behring's Strait exploration with the other ships under Captain Collinson will arrive at its destination sufficiently early this year, to search a large portion of the sea between those Straits and Melville Island, before the winter sets in again.

Such, briefly, are the measures adopted to save our hapless countrymen ; and it were ungrateful not to mention the warm feeling of the American Government in the same cause ; a feeling for which I had the honour to express your thanks to their President. Individual sympathy and munificence have also been strongly awakened in that country ; and even now two ships, the *Advance* and the *Rescue*, are being fitted out for the Polar Seas at the expense of Mr. Henry Grinnell, of New York, which, conducted by officers of the United States' navy, will brave every danger for that benevolent purpose. The British nation has a right to expect that the Government of this great maritime country will do all in its power to carry succour to those so especially requiring it ; and nobly has it met that expectation, as well in the outfit of expeditions, as in proclaiming a munificent reward for those who find and relieve the sufferers. Whatever may be the result of these measures, as well as of the admirable and exemplary efforts of Lady Franklin—with whom every heart must sympathize—one useful moral will be elicited : it will be shown, that when Englishmen are ready and willing to hazard their lives for their country's honour, they will not be neglected in the hour of peril.

ASIA.

Having had some cognizance of its outfit, I feel happy in making the announcement that the two first volumes of Colonel Chesney's expedition to the Euphrates and Tigris in 1835, 36, 37, are now published, and placed on your shelves. It will be in your recollection that when the comparative advantages of the routes to India by the Red Sea and by the Euphrates were warmly discussed in Parliament, it was resolved to survey the latter, by means of an exploring party and two iron steamboats. The volumes before us treat principally of the geography and history of the countries between the Indus and the Nile ; but the details of the expedition are reserved for the forthcoming portion of the work. When complete, it will form an im-

portant addition to our acquaintance with those regions, which, with Asia in general, still remain a vast field for the English traveller.

The East India Company, throughout their commercial career, have never forgotten their duties as Monarchs, and every branch of science is indebted to their liberality and patronage. In our own especial department, they have not only carried out the more general details of the geography of those extensive regions, but have also reared trophies of the highest scientific character, which will attest to future ages their enlightened regard for the progress of human knowledge. Such, for instance, is that laborious and costly operation, the measurement of the great meridional arc of India, begun by Colonel Lambton about the commencement of the present century, and recently completed by Colonel Everest. Nor has the spirit at all flagged. During the last year, the trigonometrical survey of India has made considerable progress under the able superintendence of Lieut.-Colonel Waugh, the Surveyor-General; and, on inquiry, I find it is expected that the triangulation of a great part of northern Hindustán, from about the latitude of 24° N. to the mountains, and from the longitude of 76° E. to the meridian of Calcutta, will be completed in the ensuing year. The topographical surveys embraced within this area, are proceeding simultaneously, and keep pace with the trigonometrical operations. Surveying parties are still actively engaged in Gumsar and the Nizám's territories. Materials for a map of a large portion of the Bombay Presidency have been collected, and their arrival in this country may be shortly expected. The great surveys in the Punjab, are advancing rapidly under the charge of Captain Du Vernet, of the Madras European Regiment.

The hydrographical talents of the Company's maritime officers have long been acknowledged, and are now actively exercised. I am given to understand that the survey of the entire coast of Arabia is actually completed, and the last sheets of it may be hourly expected. A minute survey of the tidal channels of the Indus has recently been executed by Mr. Fennell, of the Indian Navy; and among the new marine surveys which have lately been engraved and published by our skilful member, Mr. John Walker, by order of the Court of Directors, express mention should be made of the entrance to the Red Sea, by Captain Haines; sheet 2 of the south-east coast of Arabia, by Captains Haines and Saunders; and the islands and dangers between Socotra and the north-east coast of Africa, by Lieut. Grieve. There is also a new edition of the chart of the Laccadive Islands, containing a recent survey of the northern portion by Lieuts. Selby and Taylor; the har-

bours of Dewghur, Gheriah, Cochin, and Calicut Roads, by Lieuts. Montrieu, Taylor, and Moresby.

To the meritorious productions of these gentlemen, must be added the works of the officers of the Royal Navy in those remote regions. The China-Sea, with the coasts of Borneo, are being accurately surveyed by Commander Bate; and the seaboard, ports, and places fit for settlement in New Zealand, are under the examination of Captain J. L. Stokes. The approaches of Torres Straits along the shores of New Guinea, are confided to the skill of Captain Owen Stanley, son of the late Bishop of Norwich, our regretted Member: in a letter to the Society, of the 16th of last October, this intelligent seaman mentions his having completed the examination of the Louisiade Archipelago: "The most remarkable feature we saw," he observes, "was a high range of mountains extending from the Cul de Sac de l'Orangerie to Redscar Point, a distance of nearly 200 miles; some of the peaks of which were more than 10,000 feet above the level of the sea, and one as much as 12,800."

Various detached pieces of valuable local information are to be gleaned from the Journal of the Bombay Geographical Society, the Calcutta Journal of the Asiatic Society, the Madras Journal of Literature and Science, the Singapore Journal of the Indian Archipelago, and other Oriental periodicals of the past year. Such are the account of the Dusannee and Cheannee countries, by Captain Reynolds; the discussions on the Snow Line in the Himálaya, by Captain Thomas Hutton and Lieut. Strachey; a trip through the Kóhistán of the Jallundhar, by Lieut. Parish; Notes on the Geography of Western Afghanistan, by Major Anderson; Papers on the Physical Geography of the Himálaya, by Mr. Hodgson; the Statistical Report on the Circar of Warangul, by Dr. Walker; and the various meritorious essays with which those well conducted works are enriched. Nor must we overlook the additions constantly made to our Oriental knowledge, by the excellent Journal of the Royal Asiatic Society of London.

After Dr. Hooker's release from captivity as already alluded to, he forthwith returned to his botanical, and other researches, tending to solve the problem of the snow-line level. From a letter dated July 25, of last year, he was then on the table-land of Thibet, beyond the Sikkim frontier. And here an incident is related, which I think proper to mention in a Meeting where many are present who must be interested in travellers' instruments. Dr. Hooker relates his having attained the summit of Mount Touglo, to which his barometrical

observations, taken simultaneously with those made at Calcutta, gave a height of 10,078·3 feet; and the altitude by Colonel Waugh's trigonometrical survey was 10,079·4 feet. This is certainly a beautiful agreement, and one which Dr. Hooker considers as a "marvellous instance" of the perfection of his instrument and the accuracy of the tables. But a striking example of a similar coincidence had occurred to myself, many years before; I allude to the height of Mount *Ætna*, as determined by two individuals at different times, and without any knowledge of each other's intentions. The results for the summit of the cone were—

Myself, in 1814, *trigonometrically* . . . 10,874 feet.

Sir John Herschel, 1824, *barometrically* 10,872½ feet.

And although the late Captain Basil Hall has published the particulars, this slight recurrence to the fact may not be altogether out of place; more especially as my exertions were stimulated by that illustrious geographer, Baron Alexander von Humboldt, a continuance of whose friendship I am proud to acknowledge.*

At the earnest request of Dr. Gutzlaff, who had presented to the Society various elaborate papers on Eastern Asia, your Council appointed a Committee of Inquiry, as to how far it might be desirable to form a series of maps embodying the latest and most accurate information that could be brought together respecting that distant part of the globe—far more interesting to the public now, than at any former period. He recommended the compilation of five maps, illustrative of the following countries:—

1. China Proper.
2. Manchuria and Mongolia.
3. *Thi-an-shan*, above Thibet.
4. Thibet.
5. A general map of the whole region.

Dr. Gutzlaff was good enough to attend the Committee; as did also M. Isidore Hedde, a French gentleman who had travelled over a large portion of China, with a view chiefly to make himself acquainted with the natural and artificial productions of that country.

Previously to the late war with China, and more especially during

* For the sake of accuracy, I should here notice that in Humboldt's comprehensive review of physical nature, called *KOΣMOΣ*, there is a misquotation. At page 41 of vol. i. he says—"Aetna 1700,4 T. or 10874 engl. Fuss nach Cap. Smyth; zufolge einer Barometer-Messung von Sir John F. W. Herschel, die er mir 1825 schriftlich mitgetheilt, 10876 eng. Fuss, oder 1700,7 T." The figures I have given *ut supra* were sent to me by Sir John in that year, and have since been confirmed by him.

its continuance, various coast surveys were made by order of the Board of Admiralty, which have since been published, together with the charts of the Yang-si-kiang river, and the islands of Hong-kong and Chusan. Kien Lung, the contemporary of George III., is supposed to have set on foot a new survey of his dominions, an imperfect copy of which is said to be at the India House: and there is another native map—if not the same in a less imperfect form—in the possession of the Grand Duke of Weimar. These are the only new available materials suggested to the Committee as applicable to the object in view. They have reason to believe, however, that her Majesty's Government have in some measure anticipated the desire of Dr. Gutzlaff; and that at no distant period an improved map of China will be produced, under better auspices and with higher testimonials than the Society can command. One obstacle to the construction of a satisfactory map of China, has hitherto been, the difficulty of transferring the names of places from the Chinese characters to those of the Latin or English Alphabet. This difficulty, however, if not wholly removed, is at least materially diminished by the publication of two works, both of which are in the possession of the Society; one of these is by Mr. Wills Williams, and the other by M. Biot, jun., whose death we now deplore.

Respecting Manchuria and Mongolia, a survey of those countries, commenced in the year 1760, has been continued, it is said, up to the present day; but it does not appear that any part of it has found its way to this country. The Committee has not received any later information relative to these extensive regions, than there exists in the works of Klaproth and Rémusat. In the library of the Royal Asiatic Society may be seen a map of Cochin China, which Dr. Berghaus considers as excellent in construction, though imperfect in execution. A correction of its errors, by French surveyors, is preserved in the Hydrographical Office; and I understand that a map of Japan has been commenced at that establishment. Our intelligent Member, Mr. Arrowsmith, is engaged in compiling a map, upon a large scale, of Thibet and Burmah.

And here I should state, although possibly prematurely, that by a letter from the Hon. Edward Everett, the late American minister to this country, and one of our Corresponding Members, I learn that he is about to present this Society with a copy of a curious large Chinese map, in his possession. He has sent to Mr. Joseph Dixon, of New Jersey, to inquire if he could copy it by his Anastatic process; and he says—"If I cannot get the map copied in this way, I will see if I cannot get a copy of it made by some other means."

AFRICA.

In delivering your award to the Rev. David Livingston, for his journey to Lake Ngami, I have already given my opinion upon African discovery; but I hope to be permitted to say a few more words on such a subject, even at the risk of repetition. With the decline of Mohammedan fanaticism, our knowledge of that singular continent is on the advance; it is now, so to speak, geographically invaded on all sides, and those barriers which hitherto repelled inquiry, are giving way. I alluded to Colonel Ducouret's proposals for a very extensive journey, or journeys, into the interior, from Senegal; and I may now add that they have been finally accepted by the French Government. Another exploration—political, commercial, and scientific—has been projected by Dr. Bodichon, of Algiers, which is to open a trade between the Mediterranean shores and the millions who inhabit Súdán; but the Doctor requires an armed party of a battalion of seasoned Frenchmen, and 300 or 400 trusty Africans, in aid of his views. That force is sometimes effective in exploration, is shown by Dr. Jacquot's '*Expédition du Général Cavaignac*' in the Algerian Desert, just published at Paris.

You are aware, Gentlemen, that Baron von Müller communicated to us, his intention to carry an expedition up the White Nile, with the view of determining its source, and forming a settlement on its banks. In the event of his efforts proving so far successful, the Baron has determined to quit the Nile and to proceed westwards, endeavouring to reach the coast. This, if it is of possible accomplishment, will be a splendid triumph; for independent of the chorography of the several districts, reports—but certainly vague ones—from that part of the interior indicate an unexpected degree of civilization; for we are even told of there being schools of instruction, where their written characters are peculiar, and perhaps more ancient than even those of the Arabs.

Dr. Heinrich Barth, who travelled from Morocco to Egypt, has published his *Wanderings along the Punic and Cyrenaic shores of the Mediterranean*; and another volume is promised, giving additions to our ancient geographical knowledge of Egypt and Syria. Meantime the Doctor, with the German botanist, Dr. Overweg, has joined the expedition under the direction of Mr. James Richardson from Tripoli through Central Africa, and thence to the Nile. Mr. Richardson, you are aware, is invested with certain diplomatic powers by our Government; and the Berlin Geographical Society has contributed 1000 dollars towards defraying their expenses.

Mr. Mansfield Parkyns, who for many years has been in Eastern Africa, proffered his gratuitous services to this Society as an African explorer. I had the pleasure of conferring with him respecting the particular region which he proposed to explore, and found that his own plan was to proceed up the Nile, and thence afterwards to cross the continent to the Gambia—a proposition which, even now, may to some seem chimerical. He started in the beginning of this month for a preparatory visit to Constantinople and Cairo; having first presented the Society with the chronometer he had hitherto carried, and a very excellent mountain-barometer by Newman, as memorials of his travels which Mr. Murray is about to publish.

The Atlantic shores of that vast region are continually more disclosed by our cruisers and traders, while fresh glimpses of the interior are occasionally afforded by travellers; and the recent appointment of Captain Becroft, a member of this Society, well known by his contributions to your Journal, to the office of Consul-General for West Africa, may be deemed as a most fortunate incident for these benighted regions. He sailed early in this year, and is accompanied by our best wishes. While upon this subject, I ought to mention that Captain de Kerhallet has furnished the French *Dépôt de la Marine* with the hydrography of the coast of Senegambia, from Cape Roxo to the Isles de Los, including the Archipelago of the Bissagos, in an octavo volume: *Isles de Los*! Surely it is time to restore the lost substantive; for it is merely owing to an omission by some grossly ignorant map-maker that the original name—Los Idolos—has been blotted from geographical nomenclature.

Among other rumours on which substantial particulars are desirable, Captain Bouet-Villaumez is stated to have crossed the dangerous bar of the Grand Bassam river in March, 1849, when he persevered until he reached two magnificent lakes; and he discovered that the Grand Bassam is a confluent of the Niger. A young native of the banks of the Gambia, named Panet, is said to have been appointed by the French Government to undertake a journey across the Sâhara, for the purpose of opening a communication between Algeria and Senegal across the Desert. Monsieur Panet accompanied the active Raffenet on his travels along the river Falémé, and to the gold-mines of Keniébe, in the years 1843-44.

Mr. Francis Galton, of this Society, a gentleman of energy, had formed a plan of either returning to North Africa, where he had already inured himself to the climate, or penetrating into the interior from Natal. Meanwhile, the news of the discovery of Lake Nguni

arrived, when—persuaded by Mr. Arrowsmith, and Dr. Shaw, our secretary—he determined to proceed to the South, survey the Lake, and penetrate Northwards by means of the rivers already mentioned. He sailed in April for the Cape and Algoa Bay, provided with three boats, constructed here on the most approved principles, and well furnished with provisions in their most concentrated form; as well as a plentiful stock of instruments, arms, medicines, and trinkets of all sorts. Earl Grey obligingly provided him with letters of introduction to the authorities at the Cape, and Mr. Arrowsmith furnished him with several maps made expressly for the occasion. Mr. Galton, accompanied by a Swede, Mr. Andeson, may possibly meet with Mr. Charles Johnston, who lately sailed for Port Natal, to ascertain the source of the Malalareen, an affluent of the Orange River; and, if he can, afterwards work his way up into Abyssinia.

The east side of Africa teems with interest for the traveller; and we find it accordingly an object of earnest research, as has been found from the communications of Messrs. Krapf, Barker, Rebmann, and Cruttenden. We are still without further intelligence of the fine country north of the Taita range mentioned by Dr. Krapf; nor have we heard more on the Kilimandja-aro, or “Mountain of Greatness.” We wait for further details with considerable anxiety, since the determination of several relative points will bear upon a great physical question. Mr. Rebmann, who is a missionary in Eastern Africa, does not state how far the summit of his mountain rises above the limits of perpetual congelation; but he clearly intimates that a considerable portion of its height is covered with eternal snow. In that latitude the line of constant low temperature may be estimated at about 17,000 feet, so that the supposed height of the culminating point—20,000 feet—may be, for the present, reasonably assumed. This circumstance really gives a shade of probability to the hypothesis which suggests a mountainous chain of 300 miles from, and parallel to, the eastern coast, and from which the upper affluents of the Nile would issue. But even if this assumption were proved as a fact, it would not at all prevent the existence of other distant affluents in the S.W. and S. Indeed, the true source or sources of a large river, can seldom be traced without a long and diligent search; and when we consider all the moral and physical obstacles which beset the *vexata questio* respecting the springs of the Nile, we cannot be surprised that the problem of its origin still remains unsettled.

Between the lands recently explored by Dr. Krapf, and the entrance of the Red Sea, lies a region which demands both geographical and

commercial inquiry: its ancient state has been ably described to you by Mr. Desborough Cooley; and its modern condition in part sketched by Lieutenant Cruttenden, of the Indian navy. Still much remains to be done; and as the point has been one of great interest to the energetic Admiral Sir Charles Malcolm, for upwards of fifteen years, he became very desirous of its fuller investigation. Accordingly, on learning, last February, that Dr. Carter, a zealous and intelligent traveller, now at Bombay, would undertake it, Sir Charles and myself waited on the Chairman of the East India Company, Sir Archibald Galloway, to request his countenance of an officer so employed. We were very courteously received, and though Sir Archibald is since dead, there is every reason to believe that the Sómali expedition will be proceeded with. Mr. Cooley has informed you of the ancient trade and produce of this Regio Cinnamomifera; and all inquiries show that it still abounds in aromatics, spices, myrrh, ivory, ostrich-feathers, aloes, indigo, cotton, and various other valuable articles of commerce. The gum-bearing mimosas extend from Suákim to Cape Guardafuí, spreading far into the valleys of the interior to the south of Abyssinia; and we find that much of our Mokha coffee is actually brought from Zeíláb, where it is collected from the neighbourhood. "I should average," said Lient. Cruttenden, "the quantity of gums exported from the Sómali coast at 1500 tons, though occasionally, after a good season, I believe that the Mijjertheyn tribe alone export that quantity."

AMERICA.

The hydrography of our trans-Atlantic possessions is steadily advancing, Captain Bayfield being now employed upon the southern shores of the Gulf of St. Lawrence, Commander Shortland in the Gulf of Fundy, and Lieutenant Lawrence among the West India Islands. In the United States, the hydrographic operations and chorographical details are proceeding with extraordinary accuracy and dispatch, while, with their characteristic ardour, its travellers have overspread the vast regions which separate the two great oceans. The coast survey is a truly useful and national undertaking, and has been most creditably conducted through all its various departments of science. Upon this point I am enabled to speak positively, from having been long supplied with their labours, and from the correspondence of Lieutenant Gilliss, Lieutenant Charles Henry Davis, and other sound authorities. I have studied the question closely, and hesitate not to pronounce my conviction, that though the Americans were the last in the field of practical astronomy and geodetical surveying, they have, *per saltum*, leaped into

the very front ranks. Were I asked to give instances, I would say—look to their beautiful maps and charts; see their practice of establishing differences of longitude by electricity, and the probable extension of its wondrous chronographic application; mark their novel methods of taking and recording transits by means of a galvanic current; and consider the excellence and refinement of their astronomical observations for geodetical purposes, as proved by their being able to detect the alteration in the direction of gravity caused by differences in form and density of the materials composing the earth's crust!

The present state of the great Coast Survey was very ably communicated to the American Association for the Advancement of Science, on the 16th of last August, by Professor A. Bache, the skilful director. This report clearly shows what is completed, what is in hand, and what remains to be performed; and I beg to draw your attention to it. But in showing the prospects of bringing the work to a period, the Professor says—"What progress the Oregon and California sections may show, we can only tell when the California gold-mines are a little exhausted." The discovery of this El Dorado, by which the wild dreams of the age of Columbus are realized, recalls to my mind the danger of reckless criticism. For when Sir Francis Drake discovered that coast, the *Journal* said—"This country seemed to promise rich veins of gold and silver; as wherever they had occasion to dig, they threw up some of the ores of those metals." To this Mr. Kerr, who edited a collection of *Voyages and Travels* in 1814, makes this unpolite note—"This surely is a gross falsehood, as even the Spaniards, so much experienced in mines of the precious metals, have found none in California, though possessing missions among its rude and scanty population in every corner, even in this very spot." And to this luminous *non sequitur* he subjoins *Editor*.

Of the several scientific discussions brought before the American Association, was one by Lieut. C. H. Davis, on the policy or impolicy of rejecting Greenwich as the normal point, and establishing a new prime meridian on that continent, to which all their geographical positions and territorial limits might be referred. This has given rise to an animated discussion: Professor Peirce, Lieut. Davis, and Lieut. Maury being in favour of an American meridian; and Mr. G. P. Bond the astronomer, Professor Lovering, and Professor Johnson taking part against it—while Dr. Hare expressed his wish for a universal meridian. The matter is referred to a Committee, and the opinions of their most scientific men are to be solicited. The question, in my own persuasion, is so purely arbitrary, that changing a meridian is

of little consequence except in the undesirable confusion liable to arise in maps, charts, and navigation, from multiplying the beginnings of longitude and points of departure. It is a point on which nature interposes no bounds: every place has its great circle passing through the zenith, nadir, and terrestrial poles, dividing the sphere into two hemispheres, the east and west sides of which are matters of course. A common meridian might simplify our tables, but the difficulty would lie in the selection. When Ptolemy assumed the Canary Islands for the zero point, he considered them as the farthest possible western limit; and though we have so long known that such an opinion is not admissible, the French, till very lately, reckoned their longitudes from Ferro, one of those islands, by command of their King. And really, in point of fact, Ferro had been as good as any other meridian, except for the anomaly of there never having been an observatory there. There is no nationality in true knowledge; and if we cannot obtain a meridian common to all the world, we may still see that the fewer there are, the better for practice. The grant lately made for publishing an American Nautical Almanac may cast the die; but, as I have already told those who did me the honour of asking my opinion, I consider that measure to be very unnecessary, for I would have as few ephemerides as meridians; and certainly England and America, using the same language and methods, may well make a common stock in the liberal arts and sciences.

Among other powerful impulses to the advance of intellect in the United States, is unquestionably the founding of that meritorious and powerful means of progress, the Smithsonian Institution. This was established by the will of John Smithson, an English gentleman, a worthy scion of the Duke of Northumberland's lineage, who left his property in trust to the United States of America, for "the increase and diffusion of knowledge among men." This responsible and honourable trust was accepted by the Government; and an Act of Congress, passed on the 10th of August, 1846, appointed as trustees and governors the highest official members of the administration, and individuals selected for their known acquirements. Beside the formation of an extensive library and museum, a gallery of art, and lecture-rooms, the Institution promises to publish an annual volume of original researches in history, philosophy, science, art, and literature. Its first volume, which has been presented to our library, contains an account of the ancient monuments of the Mississippi Valley, with numerous plans and illustrations. And through the acceptable agency of Mr. Henry Stevens, that part of Mr. Smithson's intention, the "diffusion of know-

ledge," is already in operation,—in that he is authorized by the Regents of the Institution, to facilitate the interchange of scientific memoirs between the United States and this country ; thus, as it were, throwing an intellectual bridge across the Atlantic, and thereby more extensively carrying out the testator's design.

A subject which—especially since the recent territorial acquisitions from Mexico—agitates the public mind in America, and I may say in England also, is the prospect of making an equatorial channel, so that the largest vessels may pass from the Atlantic into the Pacific Ocean, and thereby avoid a hazardous and circuitous navigation. This has been a desideratum for upwards of three centuries. It matters little that the railway which is to cross the Isthmus of Darien and join Chagres to Panamá is under execution ; a water communication is loudly demanded, and three lines of transit are actually under consideration. These are, one across the Isthmus from Chagres or Porto Bello to Panamá ; the second, from Port San Juan, in the Caribbean Sea, across the Lake of Nicaragua, to Realejo, on the Pacific ; and a third, from the mouth of the river Coatzacoalcas to Tehuantepec. The Spaniards had long a notion that Panamá, insalubrious as it is, might be made the commercial focus of the world ; and the Isthmus named from it—only 45 miles wide—is still the great object of attraction, although its porphyritic backbone, and its climate, seem to be insuperable obstacles. The province of Nicaragua—93 miles across in a straight line—is healthy ; but as a spur of the Andes crosses its lake, the expenses of excavating through such a mountain would still be enormous ; and there is no good port on either shore. The Isthmus of Tehuantepec is 136 miles in breadth, but, as shown by our zealous member, Mr. O'Gorman, has a healthy climate and very productive soil, abounding in large timber. From the surveys of Moro, and statements of Don José de Garay, it appears that no tunnel would be required ; though there must be a canal of 50 miles in extent, cut through a flat country, to connect two rivers.

In order to meet the demand occasioned for the chorography of the districts in question, Mr. Wyld published a map of Central America, showing the different lines of communication between the Atlantic and Pacific Oceans, on a sheet 2 feet 2 inches high by 3 feet wide. Fresh materials have, however, arrived, and Mr. Trelawney Saunders is now preparing two very complete maps : the first is on a double elephant sheet, with a scale of 33 miles to an inch, the largest of any map of that country yet constructed ; it extends from the Isthmus of Tehuantepec to that of Darien, and includes the above three proposed lines between the two oceans. The whole is carefully compiled from the

best existing documents, aided by the surveys and examinations of Moro, Garella, Hopkins, Lloyd, and Lieut. Baily of the Royal Marines, who had the advantage of a long residence in those parts, access to state documents, and personal management of Government surveys. Mr. Saunders's second publication is a map of the Isthmus of Panamá, by Mr. Evan Hopkins, a civil engineer, on a scale of about nine English miles to an inch; a scale which gives room for the insertion of the features of this important part in considerable detail. It includes the routes from Panamá to Porto Bello; and from the Gulf of Darien, by way of the Atrato and Naipi rivers, to Cupica Bay.

Much of this part of central America has been lately visited by M. de Morelet, an experienced naturalist, who went up the Usumasinta, its largest river, for about 100 leagues. Obligated then to land, he advanced 80 leagues further—generally through virgin forests—and reached the all but unknown district of Peten, in Guatemala. The '*Comptes Rendus*' also mention that in September, 1849, Colonel Acosta wrote from the river Magdalena, in New Grenada, that he had attempted in vain to advance eastwards of that station, beyond about 30 leagues. Mr. A. S. Oersted has also traversed those regions for the purposes of Natural History, and is now busily occupied with a scientific arrangement of the collected materials. He followed the chain of volcanoes in Costa Rica, but declares that he could not find the active peak of Chirripo mentioned by Colonel Galindo.

In South America, botany and natural history have been more pursued than geography; though the elaborate researches of such men as Dr. Weddell and others, who are sent by the French Government to botanize there, are sure to have their due effect also in correcting the chorography of the scenes of their exertions. M. Desmadryl has sailed on a voyage to Chili, chiefly with the intention of exploring the physical geography of the western Cordillera up to the Isthmus of Panamá. And by the copy of a letter from Lieut. Gilliss to Mr. E. Everett, with which I have been favoured, dated Santiago de Chili, the 30th December, 1849, I find that the scientific expedition under that able officer had arrived at its station and commenced operations. "The climate," he says, "appears very favourable to observation, and we have lost only three nights, since commencing differential measures with Mars on the 16th instant."

CONCLUDING REMARKS.

Such has been the progress of geography during the past year: but notwithstanding the extravagant length to which this address has

been extended, it is only too possible that some interesting topics of inquiry, as well as recent works of importance, may perchance have passed unnoticed; for unless travellers and authors keep themselves more in communication with some such central point of union as this Institution affords, it is scarcely possible to follow them, each and all, through their divers explorations. If therefore any such accidental and unintended omissions should be observed, I trust that the parties unnoticed may see the advantages to be derived for their own reputation, as well as for the progress of geography, from forming a closer connexion with such Societies as this, by a stronger support of its executive duties.

That this spirit of co-operation has not hitherto existed to the desired extent, seems to be owing to contracted opinions having too generally obtained as to the objects and ends of our especial branch of knowledge; from its being considered in part rather than in its whole extent; and from investigators having been therefore separated into various subdivisions working in ignorance of, or with a feeling of opposition or rivalry towards, each other, rather than with that unity of purpose which would flow from a clear perception that every different department is but a ramification of one and the same system, an affluent of the grand tide of geographical progress into which they must all at length merge and swell the onward stream.

Till lately the general designation, "Geography," has been confined to barely a single division of the subject (if that can be properly called a division which is neither very precise in its limits nor in the subjects which it comprehends), namely, to little more than an enumeration of the relative distances of cities and towns within certain boundaries of the terrestrial surface, arbitrarily established by political expedience, and exhibited to the eye by means of a conventional system of geometrical projection. But as geography really embraces almost all the sciences, and its inquiries are pregnant with consequences important to the improvement of man, perhaps the meeting will indulge me with a few minutes of additional attention while I endeavour to trace the extensive comprehensiveness of the subject, and show how many and what various classes of persons may all contribute to the progress of science, and may all become members of the Geographical Society.

We have, indeed, a vast field of study before us, in which collectively all our arts, sciences, and pursuits are in close and obvious connexion. Geography has occupied the attention of philosophers from the earliest ages, but only reached its present approximation towards rigorous

accuracy, at the period when the exact sciences being better understood and more extensively cultivated, caused the adoption of appropriate and effective methods of inquiry, with new means and appliances for observation, and enlarged facilities of intercourse.

The epoch of this renewed datum-step in the progress of geographic science may be fixed at about the commencement of the seventeenth century; since which time all the bearings of the subject have been more clearly defined, and the offices of its allies more distinctly subdivided. Thus, *Astronomy* considers the mass, figure, size, motions, properties, and relative influences of our globe, and other heavenly bodies; and is reducible to nautical, geodesical, and cosmical uses, with unerring exactitude. *Geology* informs us of the earth's mechanical structure, and the traces of the revolutions through which it has gone, owing to the consequences of external and internal heating and cooling, and the mutual action of its various components. *Mineralogy* inquires more closely into the particulars of the elemental constitution of the geological materials; and *Meteorology* studies the variations of the atmosphere enveloping the earth, and its effects through all the Protean changes on inorganic substances.

Discoverers in any one of these sciences, cannot but be considered more or less directly as promoters of geography; and yet the above-named only apply to the inorganic section of our pursuit. Those which relate to the organic, have a still closer connexion and a more immediate interest.

Of the studies connected with organic matter, *Botany** is that which first claims our attention, as well from being related to the simplest forms of living matter, as from the marked enlargement that has come over the spirit of its inquiries within the period of modern geography. *Zoology* and *Palæontology* are pursued in a similar manner, and with a like success; and while questions respecting the "habitats of species" and "centres of creation" are conferring a deeper importance on those sciences, they are at the same time bringing them more completely within the pale of geography. With equal strides, has *Anatomy* been advancing at a gigantic pace: comparative anatomy, strengthened by the powerful aid of the achromatic microscope, has penetrated so thoroughly into the internal mechanism of animated beings, and examined

* I cannot allude to Botany without reminding the reader, that among other plants before unknown to naturalists, which have been brought to light through the agency of the Royal Geographical Society, the public is indebted also to them for that magnificent and gigantic water-lily, the *Victoria Regia*. It is, at this moment, flowering at Syon House, where, by the kindness of His Grace the Duke of Northumberland, one of our Council, I have just examined its wondrous structure.

so closely the varied functions of all the vital organs, that, reacting from the present upon past time, it has enabled the palæontologist to reason as securely concerning the denizens of the earth in ante-diluvian periods, as concerning the animals which are still living and moving around us. The crucial instance recently afforded by the perception, from a mere fragment, as to that gigantic bird, the *dinornis* of New Zealand, and its complete confirmation by subsequent discoveries there, though so memorable, is too well known to most persons present to be dwelt on now; but its geographical bearing may be pointed out, namely, the indication thereby afforded of a vast continent having existed once over Polynesia, of which the present islands are only the more elevated portions. With regard to the rapid extinction of the bird at a recent period, and its apparent unsuitableness to continued existence on the spot where its remains have been found, it has not yet been remarked, I believe, that they may both be consequences of the sinking of the old continent; for we can easily see that if the extensive wastes and sandy wildernesses of Africa were to be submerged, and the ostrich was thereby to be driven up to the rugged and contracted and cold summits of mountains, it would neither be able to escape from its enemies, nor find its appropriate climate or food, and therefore would inevitably disappear in a short space of time, as its congener, the *dinornis*, has done.

If results so interesting to geography are obtained from observations upon the lower classes of animals, we may well expect more important consequences from the study and advance of the numerous arts and researches relating to MAN, to all his various stages of existence, to his natural and physical qualities, and to his mental attributes. It is hardly possible to do more in this place than merely enumerate, that *Ethnology* considers the distinctions of the human races; *History* details their progressive development or extinction; *Policy* forms the artificial divisions of territory, and *Commerce* directs itself to every kind of natural and artificial produce. *Strategy* seizes upon every advantage of facility, resource, and eligibility of ground; *Philanthropy* seeks to civilize aboriginal races; *Statistics* counts the population, and estimates how far the physical character of a country advances or retards the prosperity of its inhabitants, by its fitness to provide food and occupation for them. Indeed, in no human pursuit can the truth of the axiom that "union is strength," be verified more powerfully, than in the proper study of geography.

By the conjunction of such branches, physical geography teaches the actual constitution of the earth's surface, with the causes, forces, and operations which have modified it, and the effects of its inequalities in

level, as well of its surface as its irregular division into land and water; also of climate, and consequently on its organic productions and their arrangement. This is paramount; insomuch that the distribution of plants and animals, the march of the conqueror, the migration of tribes, and the growth of civilization, are all actually determined by physico-geographical causes, the due working of which tends to modify nature, improve arts, promote the well-being of man, and increase his material wealth. On these grounds, therefore, geography is the most universal of human inquiries—the astronomer, the geologist, the botanist, the chemist and the anatomist; as well as the traveller, the merchant, the manufacturer and the agriculturist, have all and severally their appropriate spheres of utility: but it requires their united and multiplied observations to generalize our acquaintance with the composition of the globe, with the varied forms of animal and vegetable life scattered over its surface, or buried in its strata, with the laws of climatology, and with other wonders of the visible world.

But of all classes of individuals, to whom we may at present look for the promotion of some one or other of the various ramifications of geography, none have such frequent and available opportunities as naval and military officers. Visiting as they do, in the public service, all the most interesting spots of the world, the field is laid invitingly before them; and it is gratifying to know, that the requisite scientific attainments for such operations and researches are already widely diffused among them, and are daily becoming more so. The members of these professions have much singleness of purpose, with a strong sense of duty, and an energetic devotedness of spirit: but still it is advisable to point out to them, the marked and important difference between the reckless adventurer and the coolly intrepid explorer; between voyages of discovery and the enterprises of trade; and between functionary missions and scientific searchings. And however difficult it may be to familiarize ourselves with the last, still it should be remarked, for the encouragement of beginners, that from the labours and researches of our predecessors we have reached a point where Science is divested of her most repulsive difficulties; and the sternest results are reduced to a tangible and available form. Hence facts and principles which a Newton or a Galileo would have yearned to know, are now at every inquirer's call.

It may be long before we shall fully know why the quail, the smallest of the gallinaceous tribe, is fated to be a bird of passage, although apparently so unfit to cross oceans and trackless deserts, —while the swift and powerful condor remains chained, as it were,

to its latitude: but still the migrations of fishes, and many other inquiries into the geographical relations of Natural History, have been attended with interesting success. The labour, however, in which the surest return can be obtained in useful facts for our more immediate wants, is rather that of collecting geodesic materials for maps; and in this line the officers of the United Service are generally best qualified to shine. War has indeed long had a marked influence on this department of geography, and hence the numerous surveys and maps of conquests, from the exploits of Alexander and Cæsar to those of Napoleon, Wellington, and our Indian campaigners. The French and English expeditions to Egypt, were the opening and renewal of our knowledge of that singular country; and even in the recent march of the American army to Mexico, the scourge of humanity was not without important results and fruits to geography.

Peace, however, also has its surveys, and grand surveys too, as well as war; and within the last few days, a remarkable instance of the peaceful class has come to hand, in the shape of two maps of London, a contemplation of which will afford food for every reflective mind.

The first of these, is a large map of the cities of London and Westminster in the early part of the reign of Queen Elizabeth. This was presented to us by Messrs. Taperell and Iunes, the publishers; and by its dimensions and characteristics, it is evidently a copy, but with additions, of the one engraved by George Vertue in 1737, for the Society of Antiquaries, "to oblige the curious of his age," from the map which then belonged to Sir Hans Sloane. The date assigned it, was 1560, on the inferential testimony of certain piers and buildings, though at first, it was reported to be considerably older. London was already so large as to create an uneasiness in the royal mind, as to the effects of its probable extension: and in the reasonings which followed, we perceive, that though calculation on precise data may be esteemed as truth in the concrete, arithmetic loosely applied to ordinary affairs may prove inexact. The fallacy of prediction on such subjects is eminently displayed in Sir William Petty's '*Political Arithmetic*,' a work printed in 1683, after much study of statistical returns and the bills of mortality. Duly pondering over the whole results—and by the "*City of London*" meaning "the housing within the walls of the old city, with the liberties thereof; Westminster, the Borough of Southwark, and so much of the built ground in Middlesex and Surrey whose houses are contiguous thereunto"—he demonstrates that the growth of the metropolis must stop of its own accord before the year of Grace 1800; at which period the population would, by his computation, have arrived at

exactly 5,359,000. Nay more, were it not for this stop, he shows that the increase would double in 40 years, with a slight accelerating increment, as he gives the amount of human beings in the city for 1840 at 10,718,880! The identical year 1800, the commencement of a truly important century, found London still enlarging, brick-fields and scaffolding were invading all its outskirts; but the inhabitants, who had increased in a reasonably rapid ratio, numbered only 830,000.

It might here be objected, that the two plans are rather topographical than otherwise; but such a consideration does not at all invalidate the conclusions resulting from their examination. The local and limited compass embraced by topography, bears to the wide generalities of geography, the same interest and import as that which biography carries to the nationalities of history. He who is acquainted with the multitudinous details of the British metropolis, cannot therefore study the exhibition before him but with surprise. On the east he will perceive that the Tower stands separated from London, and Finsbury and Spital-fields exhibit nothing but trees and hedge-rows: while on the west of Temple Bar the villages of Charing Cross, St. Giles's, and other scattered hamlets are segregated, and Westminster is a distinct city. The intervening north bank of the river Thames, or the Strand, has a line of seats and gardens of the nobility; a fact traceable in the names still remaining. At the date of this old map, London contained about 145,000 inhabitants; and was then, as now, the very focus in which the royal, the legislative, the scientific, and the trading interests of the nation were concentrated; being, as Camden said, "the Epitome of all Britain, as much above the rest as the cypress is above the little sprig." In the narrative of the visit of the Duke de Najera to the Court of Henry VIII., in 1543, London is described as one of the largest cities in Christendom, "its extent being near a league." The Thames was then the highway of the metropolis, and its single bridge a very wonder: "never," says the Duke's secretary, admiring its beauty, "never did I see a river so thickly covered with swans as this." Paulus Jovius said, that these birds in groups greeted the arriving fleets; and one of Cardinal Pole's suite described the view of the river above bridge as a vast mass of silver, from the abundance of swans as far as the eye could reach. How has Commerce altered all this

The second of the presents mentioned is from Mr. Wyld, being his latest map of London and its environs, with a novel and important addition of the levels taken by order of the Commissioners of Sewers. Wonderful is the difference. We now see a very world of dwellings of 30 miles in circuit, with a population of 2,200,000 in the city and

its incorporated suburbs, and their food—wheat, flesh-meat, fish, vegetables, fruit, milk, wine and malt liquors—costs a million of money weekly; and to this must be added the constant circulation of cash in clothing, moveables, and luxuries,—besides the enormous expenses of warming, lighting, and cleaning so vast a space. The supply of water amounts to at least 75 millions of gallons daily, to about 300,000 houses; while the coals consumed are averaged at 2,000,000 of chaldrons annually; and every thing is still on the increase. The present sewerage amounts to upwards of 7 millions of cubic feet on the north side of the Thames, and nearly $2\frac{1}{2}$ millions on the south side. Here, then, is an extent and population sufficient to cast our old map into comparative insignificance: but London at both periods was politically the same, commanding great trade, property of every description flowing into and distributed from it, bearing an important sway in deciding the opinions of the empire at large, and arbitrating the fate of many nations.

These plans, therefore, show—on grounds which topography renders unquestionable—how a city which so largely towered in public estimation in a former age, has swollen into its present amazing extent and splendour; being now the nucleus of the destiny of millions, and a monument to the world of the wealth, refinement, and public spirit of its inhabitants. In contemplating this remarkable growth, the mind is pleased with the advance of extent and proportionate populousness, instead of having, as in some cases, to deplore spaces once busy with the hum of men, but now utterly desolate. I have dwelt upon this, in order that Bacon's idea of the pleasure of studying—not merely looking at—a map, and the melancholy Burton's opinion also, may be understood. Indeed, such mental application, by leading to the further unveiling of the general cosmogony and phenomena of nature, contributes largely to the manifestation of the glorious plan, design, and harmonious fitness of creation.

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ARCHIPELAGO

SANTORIN ISLAND

ANCIENT THERA

SURVEYED BY CAPTAIN THOMAS GRAVES R.N.
H.M.S. VOLAGE

1848.

C. Cape, I. Island, P. Port, P. Point, R. River,
c. cove, rel. coral, m. mud, s. sand, st. stones, wd. woods,
f. fathoms line, 1000
The heights are in feet above the Sea.

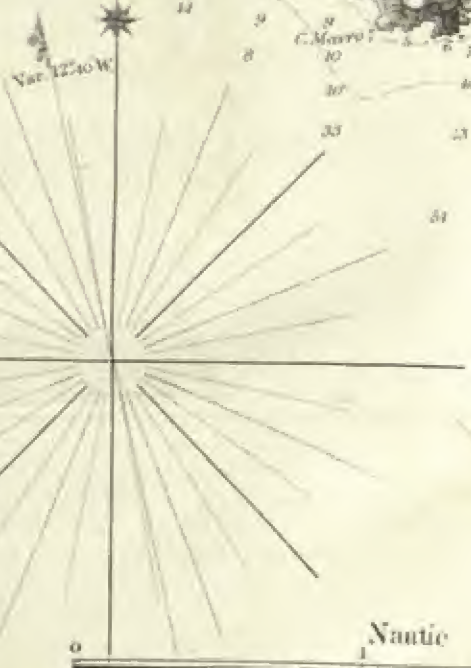
SOUNDINGS IN FATHOMS

THERASIA

NEO
KAIMENI

MIKRO
KAIMENI

PAISO
KAIMENI



Nautic Miles

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BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*Some Account of the Volcanic Group of Santorin or Thera, once called Callisté, or the Most Beautiful.* By Lieut. E. M. LEYCESTER, R.N.

[Communicated by Capt. Thomas Graves, R.N., F.R.G.S., through the Admiralty.]

SANTORIN has, perhaps, no parallel in shape, except it be Amsterdam Island, situated on the route from the Cape of Good Hope to Australia. Herodotus (iv. 147) says that it was originally called "Callisté," or the Most Beautiful; probably before the eruption, which left it much in the same state that we now see it.

This group of islands is about 60 miles N. of Crete, and somewhat more than 12 miles S. of Nio, the ancient Ios. The chief island of the group, Thera, has been likened to a horseshoe; but a crescent with its two points elongated and stretching to the westward would be nearer the mark. The N. cape is called Mavro Petra, or Black Rock; the N.E. Cape Kolumbo; the S.E. Cape Messa-Vouno; the S. Cape Exomiti; and, of those forming the two points of the crescent, the one to the N. is Epanomeria, and that to the S. Cape Akroteri. The former bears about N. by E. 6 miles from the latter, which gives the inner curve or shore of the island, an indentation of about 4 miles, and a distance (allowing for the irregularities) round it of 12 miles. The distance round the outer curve, also taken from these capes or western horns of the crescent, is 18 miles, giving a total coast line to the island of 30 miles.

In no part is the island more than 3 miles across as the crow flies, and in some parts it is not more than $\frac{1}{4}$ of a mile; the distance by land from Cape Messa-Vouno to Cape Akroteri is about 6 miles; from Cape Exomiti to Cape Kolumbo $8\frac{1}{2}$ miles; and from Kolumbo to Epanomeria, the town at the N.W. extremity, about 2 miles.

The shores round the inner curve appear to be the edges of the crater caused by the eruption which separated Thera from the neighbouring and opposite isles of Therasia and Aspronisi. They are the most frightful precipices that can be imagined, and appear of the colour of iron dross, except where their summits are capped with a deep layer of pozzolana. They vary in

height from about 500 to 1200 feet : in slope from 45° to the perpendicular. It is along the edges of these precipices that the principal towns of the island are built—Epanomeria to the N., and Merovouli and Thera in the centre of the curve or indentation. Nothing presents a stranger spectacle than these houses, like eyries perched along the very edges, and many of them excavated in the vast beds of pozzolana.

Under the town of Merovouli is a promontory called Skaro, which projects about one-third of a mile. It is steep, and upon it are the remains of a castle, built by the dukes of Naxos. Here also lived in the time of Tournefort all the principal people of the island ; but the violent shocks of earthquakes, particularly those which occurred when Neo Kaimeni (or New Burnt Island) was produced, have frightened all the inhabitants away, and it is now the abode of aquatic birds.

In order to make approaches to the towns upon the cliffs, the inhabitants—the most industrious race in the Grecian Archipelago—have cut in the side of the precipices, in three different places, zig-zag stairs or roads, with immense labour. Those leading from the sea up to Thera were constructed under the direction of Wailler, a German engineer, and cost 33,000 drachmæ ; the ascent, for a good pedestrian, will take about twenty minutes. From the summit the road runs along the edge of the precipice, and, in many places, over the habitations, which are built in the face of them ; for to the N. of Merovouli and to the S. of Thera, the chimnies rise up on each side, and there is scarcely any other sign of a dwelling to be seen.

All the northern half is composed entirely of volcanic materials, iron, pumice, lava, pozzolana, &c. ; and three remarkable looking mountains occupy a great part of the space from Merovouli to the village of Phinika, which is on the road to Epanomeria, and about a mile from it.

The southern half contains the Greater Elias, of limestone or marble formation, the peak of which is the highest land in Santorin, rising 1887 feet above the level of the sea. It is in that part where the island is broadest ; to its S.E. side is joined by a ridge called the Sellada, that of Messa-Vouno (or Half Mountain), in allusion probably to its size, which is little more than half the height of the other. It is very precipitous, formed of limestone, and its S.E. point terminates at the cape of the same name. On its summit are many remains and inscriptions of the ancient city of Thera.

At the S. extremity of Santorin rises Mount Platanimos, also of limestone ; the southern side descends to the coast near Cape Exomiti. On its eastern slopes are cut many rock tombs of a very remote age, and W. of the cape are the remains of a mole

under water, supposed to belong to the ancient city of Eleusis, but no inscription has been found to identify this spot with the site of that city.

From its western shores or cliffs, and where the mountains do not come in the way, the island has a rapid descent to the E., N., and S. coasts, and is entirely cultivated with the vine. In fact, it is one uninterrupted smiling vineyard, which, in the summer months, presents a most pleasing aspect, particularly after ascending to Thera by the zig-zag roads from the crater, where all is desolate. The villages with their whitewashed buildings spring up, as it were, out of the mass of vines. Farther to the S., the town of Pyrgos, upon its conical eminence, with Mount Elias, surmounted by the convent dedicated to the saint of that name, forms a splendid boundary to the view in this part of the island.

On the western side of the part engulfed, or, in other words, the crater, are two islets, by name Therasia and Aspronisi, fragments of Callistê, and separated from it by an eruption which Pliny mentions (*Hist. Nat.*, iv. 12, ed. Harduin). The first named is to the N. of the other, and very much larger; its length from N. to S. is about $2\frac{1}{2}$ miles, its breadth a mile, and its circuit $7\frac{1}{2}$ miles. Its eastern coast exactly agrees in strata and height with that of Thera opposite, from which it is distant at its N. end not more than a mile; it also slopes rapidly off to the opposite side, the shores of which are low. Its formation is purely volcanic; it produces wine and cotton. Ptolemy places a town upon it, which was in all probability opposite to Epanomeria, where there are two churches: one Hagia Irene, the other Hagia Phaneromena. The latter has ancient marbles in its construction, and over its door is a small Ionic capital: the former has for the support of its altar a pedestal ornamented with a garland and a bull's head; these, with a few fragments of marble and a portion of ancient tessellated pavement in the floor of the church Phaneromena, are all the remains of a town that I could find. Nearer to the shore there are ruins of houses of the middle ages, perhaps Venetian, thrown down as if by an earthquake. The inhabitants told me that when the weather was calm others may be seen under water. The Abbé Pegues, in his work on Santorin, remarks that, in 1836, some countrymen, labouring in a field, found near this spot a beautiful Egyptian sarcophagus, which they broke in pieces, and buried the fragments. I questioned the Demarch upon the subject, who sent for some people to examine them about it; they were agreed as to finding a marble which had letters upon it not Greek, and also figures of birds and deer.

Tournefort does not admit that the modern Therasia bore that name in ancient times, but that it must be Hiera, which is

part, the other has 20 fathoms. A large Austrian barque was riding out a strong gale upon the former during our visit.*

We now proceed to the history of the three volcanic mountains in the centre of the crater.

Within the last twenty-one centuries three islets have been thrown up in the middle of this gulf, which, as they came by volcanic agency, are by the Greeks called Kaimeni, or burnt islands.

The most ancient of these, or the one nearest Aspronisi, is now called Palæo Kaimeni, or Old Burnt Island. It made its appearance in B.C. 197, according to Justin.

The chronology of the various appearances of Thera and the adjacent islands is thus stated by Pliny (*Hist. Nat.*, ii. c. 87, ed. Hærduin):—"Among the Cyclades there arose from the sea, in the fourth year of the 135th Olympiad, Thera and Therasia; between the same, 180 years after, Hieræ, also called Automate; and at the distance of two stadia, after an interval of 110 years, in our age, in the consulship of M. Junius Silanus and L. Balbus (A.D. 19), on the 8th of July, Thia." The time assigned to the appearance of Thera, B.C. 237, is evidently a blunder, arising either from Pliny's carelessness or some corruption of the text. It may refer to the disruption of Thera from Therasia, mentioned in book ii. c. 12. The time of the appearance of Hieræ, according to this passage, would be B.C. 107. But the time of the emerging of Hieræ out of the sea is fixed by Justin (xxx. 4) at the year B.C. 197. Pliny's date is certainly wrong; and that of Justin may be so too. The fact, however, of the island rising above the sea, owing to volcanic agency, cannot be doubted. Strabo states (i. p. 57, ed. Casaub.), "Between Thera and Therasia flames rose out of the waves for four days, so that the whole sea boiled and blazed, and they gradually threw up an island, just as if it were raised by mechanical means, composed of liquid masses; the circuit of the island was twelve stadia. After the cessation of the eruption, the Rhodians, who were then masters of the seas, first ventured to land on the spot, and to build on the island a temple to Poseidon Asphalius." With respect to the emersion of Thia, Pliny can hardly be mistaken, as he gives the day of the month and the year of the consuls, which, as observed, was A.D. 19, or the sixth year of Tiberius Cæsar, including the year of his accession; but then it was more than 110 years after the appearance of Hieræ. The numbers in Pliny's text are doubtless corrupted.

Hieræ seems to have had two, if not three, augmentations; but

* Sir Chas. Lyell considers the islands and gulf of Santorin to be the remains of a volcanic cone, the central crater of which has been greatly enlarged by denudation, and which has since become half submerged beneath the sea; and he observes that the existence of one, and one only, deep and narrow chasm communicating with a central cavity, is wholly unexplained by the popular theory of "craters of elevation."—*Ro.*

the date of the first is uncertain. The second increase which it received was in A.D. 726, during the reign of Leo the Isaurian, and happened on its northern side, as the Abbé Pegues says, who quotes Theophaues; according to whose account it must have been produced by an eruption of prodigious force, as pumice was vomited in sufficient quantities to cover the shores of Asia Minor, Lesbos, and Macedonia. After the lapse of more than seven centuries, and according to a Latin inscription at Skaro, dedicated to Francis Crispus II., Duke of Naxos, in December, A.D. 1457, this island received its third increase on its N.E. side, where there is now the chapel of St. Nikolo, and a small bay which emits exhalations containing much iron in their composition. The Abbé Pegues quotes Père Richard, a French Jesuit missionary of Santorin, in the middle of the seventeenth century; who says that two centuries after the event the ground was still hot, and at times fire and smoke were seen to issue from that spot.

Palæo Kaimeni, at the present time (1848), shows some little capacity for cultivation, and produces a little grass, and here and there a fig-tree. There is not a vestige of ancient building upon it, and all its north end is cut up by immense fissures or rents, some near 50 feet deep. All are grim enough, being of black lava. This island has no regular cone. It is about two miles in circuit; its distance from Aspronisi is 1 mile and 4 links, and the greatest depth of water 190 fathoms.

More than a century passed away, and the Santoriniots fancied that they were secure from further troubles, when, in 1573, they were visited by another terrible eruption, which gave birth to an island about a mile and a quarter N.E. of the last-mentioned; which, being smaller than the other, the Greeks surnamed Mikro Kaimeni, or Small Burnt Island. The Abbé Pegues quotes Fathers Richard and Kircher as his authorities for the eruption. The former says, "A great number of old people in this isle say that they have seen the fire form an island near to our own, in the midst of the sea, in 1573; and for that reason it is called Mikro Kaimeni to distinguish it from the other, which is larger."

Kircher (*Mundi subter.*, l. iv. p. 182, 1668) reports from the same author a second testimony, in a conversation which they had together at Rome. "M. Père Richard tells me," says he, "that near the isle of Palæo Kaimeni a second has arisen, which, according to the testimony of the old people, burned a whole year. In the middle of this little island, which is called Mikro Kaimeni, one sees at the present day a large pit, which is small at bottom, and becomes larger towards the orifice. From this opening came forth, as from a furnace, enormous rocks and stones, mixed with clouds of ashes, and here formed a mass which rose from the bottom of the waters. He assures me that these fires, which are

charged with sulphur and bitumen, are never extinguished, and at times burst forth with great impetuosity." The interior of the cone, at this time, is exactly as described by Père Richard. Mikro Kaimeni consists of a cone 222 feet in height, rent on its south side. The crater may be about 80 feet deep, and about the same number of yards in diameter. On its north side is a considerable bank of large blocks of lava and ashes.

Though unconnected with the subject of the burnt islands within the crater, I shall mention another extraordinary volcano which first appeared in the year 1650, on the N.E. coast of Santorin, about $3\frac{1}{2}$ miles from Cape Kolumbo. I shall again refer to the elaborate work of the Abbé Pegues for my materials, who also quotes from the Jesuit missionary, Père Richard, an eye-witness. It appears, according to this witness, that—

"In the year 1649 the inhabitants of Santorin felt such violent shocks of earthquakes, that in their fear they thought of leaving the island, and seeking safety elsewhere to avoid the dangers that threatened them. The result will show how much reason they had for alarm, if they could have foreseen all that was about to happen. In the beginning of the month of March, 1650, the earthquakes recommenced with greater violence, and caused many houses to tumble down, and immense rocks to detach themselves from the cliffs, and to roll into the sea, destroying everything before them. These earthquakes were preceded by a drought, which greatly incommoded the inhabitants; also by calms so long and so extraordinary, that the oldest inhabitants had never experienced the like. This they considered as the presage of some great misfortune. The mills having ceased to work, bread became scarce, and the people were threatened with famine. In this calamity, which spread affliction around, prayers and processions were resorted to all over the island (by Greeks as well as Catholics), and preaching in the churches, and exhorting of sinners to repentance, and invoking the people to take shelter in the mercies of God.

"On the 14th of September were felt afresh violent and frequent shocks, which continued to the following day, not only in Santorin, but in all the Cyclades, and shook the distant islands of the Archipelago. They were accompanied by frightful roaring noises underground, so that even the stoutest heart quailed. In this manner the remainder of the month passed, during which, instead of diminishing, the shocks increased to such a degree that all business was given up, and all attended the churches or processions; and once, while at prayer, a shock was felt so strong, that all thought the church would fall and bury them under the ruins.

"September 27th particularly, the fear rose to such a height, caused by a shock so frightful and furious, that the houses rocked to and fro like a stream agitated by the winds; so much so (says Père Richard), that one could say with truth, '*Sub pedibus mugire solum, et juga coepta moveri.*'

"After this frightful earthquake, one saw thrown out of the sea, at three different times, about four miles N.E. of Santorin, opposite the

rock Anhydros (Amorgo Poulo), towards the island of Amorgo, a cloud of thick smoke mixed with flames, and visible at six miles, to the height of about 18 feet: at the same time was smelt a stench so horrible, that one thought it proceeded from the infernal regions. This infliction became quite insupportable, and none were able to divine the cause. Six days previously we had remarked the sea on this spot to be perfectly green, which announced the dissolution of metals which the fire was acting upon. Shortly afterwards appeared upon this spot a heap of white earth like snow, and in the form of a bird's nest; and afterwards a cloud of smoke like a high tower, which disappeared directly, and an hour after was followed by another column larger than the first. The earthquake continued all day, but not so strong, the volcano having forced an opening to allow the gases to escape, and covering the sea with pumice.

"Saturday, 28th. The volcano burst forth afresh, and another volume of smoke was thrown up out of this heap of white earth to an immense height, even to the clouds, and disappeared an hour afterwards. In the afternoon the smoke again appeared, but ten times as great, and lasted till the following day: this was the signal of a terrible explosion that was about to take place; meanwhile, the people still continuing at prayer. An eruption took place with a fearful crash, and emitted flames like flashes of lightning, lava, and red-hot stones, with a noise like cannon or thunder, and a smoke of such a frightful density that all were seized with terror.

"Sunday, 29th Sept. The smoke continued still in the same place, but in form and colour very different. In the centre of this column one perceived streams of burning matter resembling liquid fire, which darted in the air with the velocity of a thunderbolt; and from the bottom of this vast gulf of fire was kept up the most horrible uproar, and enormous rocks were thrown out with violent detenations. The sea was roaring, the earth shook, the air appeared on fire, and flames were emitted in torrents from the crater, accompanied with claps of thunder. So loud was the noise on that day, that it was heard as far as the Dardanelles. At the island of Scio the noise was so great, that the people imagined a great naval action was being fought in the neighbourhood. The earthquakes were so violent, that Langier, in his 'History of Venice,' says they were felt in Crete; and a Venetian squadron that was passing Santorin at the time, narrowly escaped shipwreck. In the harbour of Canea, the sea rose of a sudden to a considerable height, and the ships and galleys drove from their anchors, and were struck with such violence that two large ships, with several boats, were wrecked by the violence of the waves caused by the earthquake; and, according to Père Richard, the cinders were thrown to such a height as to be carried to Anatolia and Plataea. Also, says the same author, the subterranean fires threw into the air huge rocks to a distance of six miles. We have seen in the fields a stone thrown by the fire so large that fifty men could not move it. At length, after great tumult, rage, and agitation, the sea, being much troubled by the materials which were continually thrown up, ebbed and flowed upon the coasts, inundating the country adjacent.

"On another occasion the sea is stated to have burst its bounds, overflowing the neighbouring lands and houses on them, also carrying away the cattle that were feeding there, and swallowing them up for ever. On this occasion 500 arpents* of land, upon the east coast, were submerged; quantities of fig and olive-trees were torn up; and five churches thrown down. Two ancient towns at Camari and Perissa were disinterred at the same time, which probably some previous earthquake had engulfed. The road also, which then existed round Cape Messa-Vouno, was sunk beneath the waters. At the isle of Nio, twelve miles distant, the sea rose to the height of sixty feet, destroying trees and shrubs, and depositing vast heaps of pumice. At Zea the sea rose equally high, and was so much agitated that a Turkish man-of-war in the port broke from her anchor, and was wrecked upon the shore.

"The earthquakes, which had been felt with such terrible violence, produced most disastrous effects; and Père Richard says that Pliny truly remarks, 'There is no style of building so capable of offering resistance to earthquakes as those arched.' All those at Santorin are arched, and built of a mortar of extraordinary tenacity; these I have seen rock to and fro like ships in a gale, and at times resume their perpendicular. More than 200 had their roofs split, and about fifty were overturned; the mountain of Merovouli was split, and each day one sees quantities of rocks roll with impetuosity into the sea.

"Monday, 30th September, and the three following days, the inhabitants were suddenly seized with excruciating pain in their eyes. Few escaped this evil, and most remained blind three days. Many sank under the pain of this malady, and others were suffocated by the pestilential vapours thrown out of the volcano. In the parts of the island nearest to it, the number of persons killed amounted to 50, and of animals upwards of 1000 of all kinds.

"October 2nd. In the night a country vessel from Amorgo ran upon the bank of materials vomited by the volcano and heaped up below the level of the sea, when the whole crew perished from suffocation. A boat, with nine men in it, was thrown upon the coast of Nio; the crew were all dead and much inflated, eyes inflamed, and all in an attitude which indicated the actions of each at the time of dissolution.

"December 6th. The force of the volcano had visibly decreased.

"20th. The volcano almost totally exhausted, and the tremblings of the earth ceased to be felt; and at the end of the year the volcano was extinct, but the sea was observed to boil there up to the year 1656.

The island thus produced has now disappeared, leaving a bank with 10 fathoms the least depth of water on it. It is well known to the Santorin fishermen, who catch there a fish very like our perch. We had a dish of them while sounding. The bank bears about N. E. from Cape Kolumbo, 3 miles and $\frac{1}{5}$ distant. A fisherman showed us the spot by mooring a buoy upon it. I should take it to be a sunken cone, about a mile round the top;

* Arpent, a French acre, 100 French perches square.

within the 20 fathoms line, the soundings off to it from Cape Kolumbo, are 6, 12, 48, 140, 162, 83, 69, 19, 11, 10, fathoms.

On the night of October 17th, while our cutter was hove to, off the shoal, ready for resuming her work in the morning, rumbling noises were heard, like distant thunder, both at 8 p. m., and again at 11. The night was quite fine, and not a sign of a thunderstorm in the heavens.

Fifty years had elapsed since the occurrence of the eruption which has just been described, and during that time every thing had been tranquil; but the fires had ceased only to burst forth with fresh fury. The Abbé Pegues, with much industry, has also collected all the facts relative to the birth of Neo Kameni, and one of the old manuscript papers concerning the event now lies before me. It belongs to the family of Delenda. The following, however, are the most striking facts as stated by the Abbé.

"It appears that on the 18th of May, 1707, near mid-day, two slight shocks of earthquake were felt at Santorin; but they excited little attention. On the 21st following, between noon and one o'clock, another shock was felt, which made no more impression than the two others. On the 23rd, Monday, at sunrise, near the small Kameni, and at the distance of 200 metres from its west coast, where there were 8 fathoms water, and where the fishermen were accustomed to haul their nets, there appeared upon the surface of the water something like a floating rock; others thought it a shipwrecked vessel, about to be dashed against the small Kameni, and the sailors of the island, in the hope of plunder, speedily embarked and approached the spot; but upon arriving, to their great astonishment, they found that it was a new rock just come into the world, composed of black rocks and white earth elevated above the water. Half dead with fear they quickly returned to Thera. Nevertheless, the next day the 24th, many other persons, some of them ecclesiastics, proceeded to the spot to satisfy themselves, and were eye-witnesses to the fact; also for many days people landed on this bank, and stepped from rock to rock, finding many delicious oysters attached thereto; the white earth cut like bread, and was very like it in texture; also they found many sea hedge-hogs attached to the enormous blocks thrown up by the volcano. The sea became troubled, and emitted sulphuric exhalations; about this time vast numbers of fish in the neighbourhood perished. From the 23rd May, to the 14th of June, the island increased from the size of a mole-hill, and almost insensibly, without violence, without noise, without agitation, to the height of nearly seventy or eighty metres, and in the same interval increased in proportion to its elevation, and appeared to attain a mile in circuit. At this time, the sea for many miles became discoloured."

It would be beyond the limits of this paper, to enter into all the details of this phenomenon, curious as they are, for they extend over a period of more than six years.

"July 5th, for the first time fire appeared, and the volcano seemed

to have opened a passage. July 16th, between the new island and the small Kaimeni, where before we had found no bottom, there appeared a large chain of black rocks, separate and distinct, to the number of eighteen, which at last united and formed for themselves an island separate from the others, and the people called it the black island, also the first, the white island; but at length they united, and the black rocks, in the course of the eruptions became the centre of the actual island, or Neo Kaimeni.

"July 18th, the force of the volcano became greater, and many of the inhabitants removed to the neighbouring islands, Nio, Amorgo, etc.

"July 19th, fire appeared at two different points, and all the inhabitants resident in Skaro (which advances at a great height towards the burnt islands) began to move away from their dwellings, and the black island rapidly increased in size. July 31st during the night, was heard a dull sound as of many pieces of cannon fired at a distance, which continued many days, but became louder, and at these times the extremities of the island were in continual movement. August 22nd in the morning, the island had become much larger, and another chain of rocks had arisen during the night.

"Sept. 5th, the fire had opened another passage, at the extremity of the black island, towards Therasia; reports like those of subterranean artillery still continued with great violence, shaking the doors and windows. Sept. 9th, the white and black islands began to unite, but as the discharges took place, vast blocks of rock, followed by ashes, issued from the principal crater.

"21st, there was a grand explosion: red hot rocks, of prodigious size, were thrown to a distance of two miles; the volcano was then tranquil until the 25th, when it redoubled its efforts, sending all the people to church to pray for forgiveness for their sins.

"During the month of October the discharges were daily, and the great crater never ceased to play. During the month of November, the volcano was not so violent, but the smoke was more dense. Feb. 10th, 1708, at eight in the morning, Santorin experienced a violent earthquake, succeeded by a very frightful explosion from the volcano. April 15th, the same year, was remarkable for another terrific explosion.

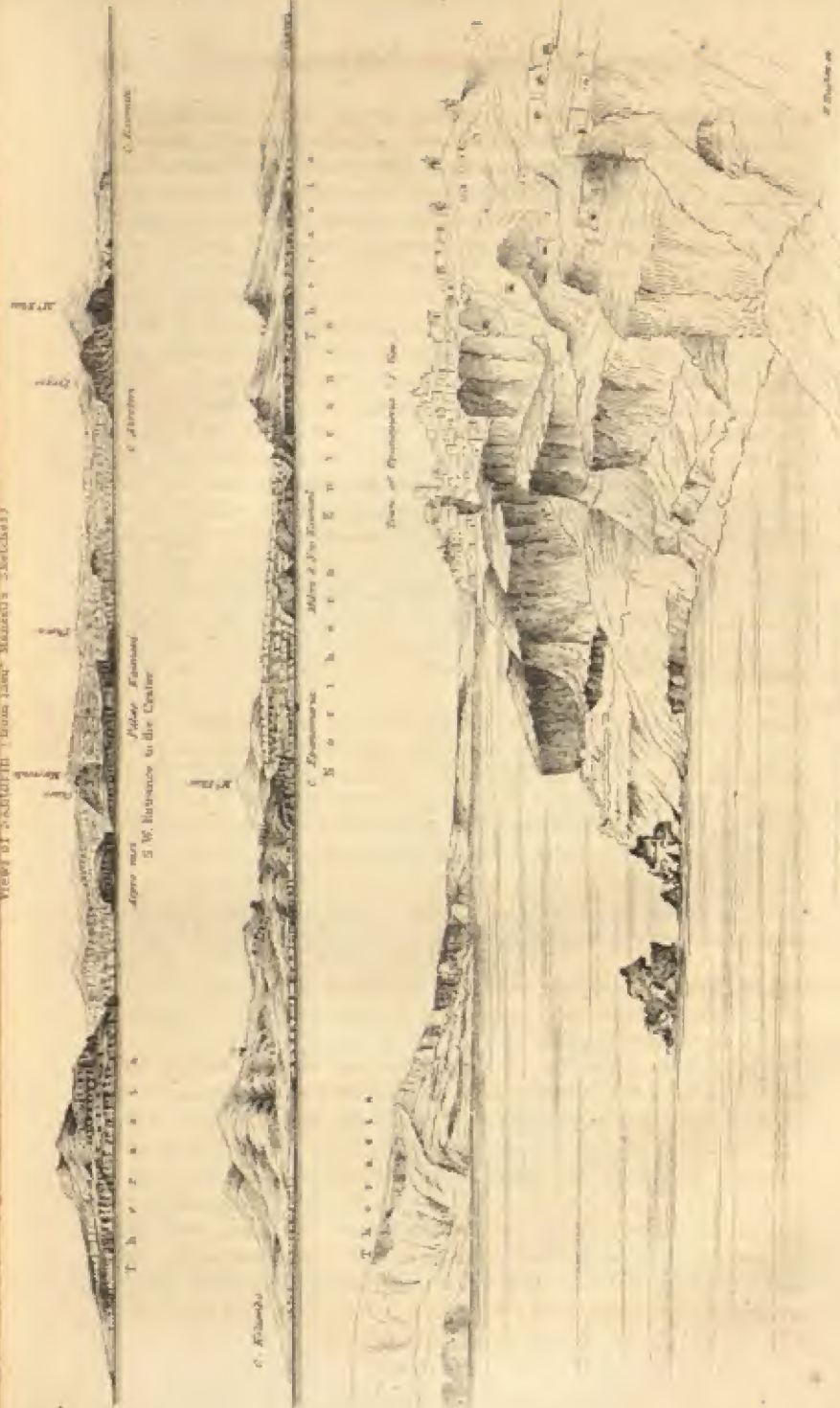
"July 15th, 1708, a party was made up, of which the Latin Bishop was one, to endeavour to effect a landing, but without success. It appears that they tried at all points, and the nearer they approached, the more boiling was the water; and it is confidently stated that the pitch ran out of the seams of the boat. The attempt was given up, they being almost smothered by a shower of ashes and a volume of smoke. The height of the island at this time was about 200 feet.

"In 1710 and 1711 eruptions continued at intervals.

"Sept. 14, 1712, the fires became extinct, and the volcano died."

Its present appearance is that of a vast bank of black volcanic rocks of various shapes and size, and about 2 miles and a half in circuit. It has a beautifully perfect cone at its S. E. side, which is 351 feet high, and close to this is the white heap of pumice,





Strait of Juan de Fuca
 S. W. Entrance to the Strait

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

C. Klamath

View of the Strait of Juan de Fuca

denominated in the narrative "white island," embedded in which I have found many shells (which were much scorched), amongst them those of oysters, hove up from the bottom at the time of the eruption. The birth of this island, disastrous as it may have been to the islanders at the time, has turned out an inestimable advantage to them, and also to strangers visiting Santorin, for it affords the safest port inside the crater. Ships lie between it and the cone of Mikro Kaimeni; the direction of the passage being about N.N.W., and S.S.E.; the width in the narrowest part about 30 to 40 fathoms; the least depth of water in the centre is 7 fathoms. The prevailing winds are in the summer strong from the N.E., and in winter from the S. I have seen some 20 vessels moored here, in Port Megalo, with fasts to either shore, where there are bollards of pozzolana and lava, at intervals, placed for that purpose; the water is so deep immediately outside the passage, that anchors are of little use. A ship of war coming into the crater with the wind at N., should steer outside, or to the eastward of Mikro Kaimeni, lower her cutters and have warps ready for running out; luff round close to the south of that island, run her fasts out to the bollards, and moor head and stern. On the S. W. side of Neo Kaimeni is a bay called after St. George, (on account of a Greek church there, dedicated to that saint,) and in it, small as it is, I have seen a number of Greek brigs; indeed a frigate might lie there. Also on the N. E. side are three small bights where small vessels haul close in, and ride out the Mel-tem or N. E. wind with safety. In the Bay of Exhalations, on the S. E., vessels may also lie, but it is unsafe with the wind to the south. The Greeks have made a small building yard at the Bay of Exhalations, and the workmen live in holes excavated in the pumice. Vessels not wishing to anchor at the volcanic islands, in the crater, may go round to the south of the island under Cape Akroteri, where they may lie in safety from half a mile to a mile off shore; the depth of water is 10 fathoms; bottom, sand and weeds. For the anchorages of Santorin I must refer the reader to the excellent chart of the island, executed, under the directions of Capt. Graves,* by Lieut. Mansell, R.N.

Santorin contains thermal and mineral waters, which have given rise to much speculation. I shall first notice those in the Bay of Exhalations, on the S. E. side of Neo Kaimeni, which is about large enough for one ship of the line. Immediately upon entering this little bay, particularly if the sea has been much agitated by a strong wind, one is struck by the red appearance of the water, which is also communicated to the black lava rocks around; and upon a closer examination, bubbles are seen rising and breaking all over the place. And not only bubbles, but strong springs sometimes rise, which come up from a depth of 6

* Just published by the Admiralty.—Ed.

fathoms, with such force as to elevate themselves an inch or two above the surface; and what is more singular, they are not always red, but sometimes green, and at other times quite clear. It is a fact clearly established that these springs have a great effect on copper. The "Research" never lay there time enough to have her sheathing thoroughly cleansed, three days being the longest period she remained; but we sunk some extremely dirty pence for a week, and upon removing a film which covered them, and which came off upon being touched by the finger, the metal beneath was as bright as when it came from the mint.

Monsieur Landerer, the King's apothecary at Athens, has analysed this water; and the following is the result:—

Specific gravity, 1·040.

	Grains.
Carbonate of soda	21·333
Ditto of lime	3·023
Sulphate of soda	0·640
Ditto of magnesia	18·300
Muriate of soda	106·666
Ditto of lime	8·000

Traces of pyrite and iodine.

Residue: Brome, carbonic acid gas, hydro-sulphuric gas, oxide of iron, and traces of oxide of magnesia.

When the wind has been blowing strong, I have known these springs discolour the water nearly to the shores of Thera, which are about a mile and a half from the source. The thermometer did not show any difference in the temperature. Invalids in the summer resort much to this Bay for bathing.

The springs of Cape Exomiti flow from the limestone rock close to the sea, within the arms of the ancient port, supposed to be that of Eleusis. I made the following observations. Friday, July 21st, 1848, 6. 30 P. M. temperature of air Fabr. 77°; of the sea, 75°; of the spring running freely from the rock, 89°. I drank some of the water; it had not the least taste of salt: many large wasps came to drink. We dug a hole in the sand close to the margin of the sea, when the spring came freely, and the temperature was then 86°.

Analysis by Monsieur Landerer.

	Grains.
Muriate of soda	23·050
Sulphate of magnesia	8·940
Carbonate of lime	3·563
Brome.	
Residue.	
Gas, acid-carbonic.	
Gas, hydro-sulphuric.	

The springs of Plaka, under Megalo-Khorio, rise near the little port of Athenous, from under some very high cliffs,

within the gulf, and, as at Exomiti, they flow close to the sea. They are tepid, brackish, and inodorous. The specific gravity is 1·010; and the analysis by Monsieur Landerer shows the following result :—

	Grains.
Sulphate of magnesia	12·500
Muriate of soda	8·740
Muriate of magnesia	3·540
Carbonate of soda	2·143
Carbonic acid.	

These waters are used to drink, as well as for bathing; and if they have all the merits that are ascribed to them, there ought to be very few sick in Santorin. I should strongly recommend the poor lepers imprisoned in the cliffs above to try their efficacy.

Palæo Kaimeni has also its iron springs, like those of Neo Kaimeni. They rise in a little pond on the N. E. side. There are also exhalations of a similar kind flowing out into the sea, from under Cape Kolumbo, but they were not in play the three different times that I looked for them, unless, as at Neo Kaimeni, they sometimes come up clear.

Fresh water springs in Santorin are very rare, and are only to be found round Mount Elias, springing from the limestone. There are only two large sources; one near Gonia, and another on the N. E. side of Mount Elias, in a grotto about one fourth of the way up the mountain. At the first named source a Turkish Vaivod (for the Turks always take great care to have good water where they can) erected a fountain. The volume of water is something more than the thickness of a man's finger. The second source, called Hagiasmata, produces excellent water. It is at the farther end of a grotto about forty feet in length. At the mouth of this grotto is a small Greek church. The stream is not large; it flows and drops from a crevice in the roof of the cavern, into a natural marble basin, which it appears to have formed. This basin overflowing, the water runs over some rounded natural steps, across the floor of the cavern into a pool, from whence it loses itself through a small aperture, and no person has yet found out its exit at the foot of the mountain. The Santoriniots, otherwise so industrious, have done nothing to secure themselves so precious a treasure, though their only supply of water is what they catch in their tanks during the winter rains; and this supply sometimes runs very short. All around the coast there are many wells of brackish water, which are used for the cattle, and sometimes by the inhabitants. In the centre of the plain, between Emporion and Perissa, are large ancient wells, which appear to me to be cut in the limestone; the water in them is slightly brackish.

About half way up on each side of the ridge, which connects Messa-Vouno with Mount Elias, there are two very small springs of sweet water.

Santorin is divided into two *demarchies*; that to the north is called Thera or Phera, and, besides the capital, comprehends the town of Epanomeria and several villages. On the promontory of Skaro are the ruins of the old ducal castle and town of the same name. That to the south is called Callistê, and comprehends the towns of Pyrgos, Megalo-Khorio, Merkurio, and Akroteri; also several villages. Therasia has its own demarch.

The seat of government, even within the present century, was at Skaro, but since Thera or Phera was built, all the principal inhabitants have removed to it. Our consul, Gaspar Delenda, a most excellent man, now seventy-four years of age, remembers about thirty years ago as many as 300 inhabitants in the former, and the latter, when he was a boy, had scarcely a house in it. Thera is situated in the bottom of the gulf, or rather in the centre of the horseshoe. Its height above the level of the sea is from 900 to 1000 feet: it stretches along the edge of the cliffs, into which many of the houses are built, space here being of the utmost value. The inhabitants are about 1400, and the whole population of the island at this time (1848), including Therasia, is about 14,380. In the time of Tournefort this island contained 10,000 inhabitants; so that in 148 years the increase has been nearly a third.

The following statement is from a small statistical work published in Turin in 1845 by the Conte Doctor Cigalla, a native of Santorin, practising there as a medical man:—

Christians of the Greek Church	. 12,480	} I suppose exclusive of Therasia.
Christians of the Latin Church	. 583	
These 583 Latins are all established in Thera.		

Tournefort mentions that a third of the inhabitants were Latins, whence it appears that many of that creed have either lapsed into the Greek Church or have left the island. The two sects do not seem to have lived in the greatest amity, and even now they keep very much aloof from each other, for it is very rare to see an intermarriage. I was once told by a respectable Greek at Milo that he would rather marry his daughter to a Protestant than to one professing the Roman faith.

With respect to resident and moving population (the latter being merchants and sailors)—

Resident	11,671
Moving	1,401
	<hr/>
	13,072

By the above table it will appear that to the square mile there are 1031 inhabitants, which is wonderful, considering that the state of Genoa has only 282, that of Lucca 135, Belgium 323, to the same space of ground. The following is the movement of the population in six years, from 1836 to 1841 both inclusive.

	Male.	Female.	Total.
Births, exclusive of those born dead .	1554	1407	2961
Deaths	1061	1143	2204
Marriages			573

The number of deaths under ten years of age is remarkable ; it is ascribed to so many people being crowded into one house. I find from the Doctor's table that out of 1054 the number of deaths in three years is as follows :—

	Male.	Female.	Total.
Under 10 years of age . . .	362	280	642
10 to 20	20	46	66
20 to 30	14	29	43
30 to 40	11	30	41
40 to 50	15	20	35
50 to 60	21	30	51
60 to 70	22	44	66
70 to 84	29	45	74
Beyond 84	8	28	36
	502	552	1054

There were not more than 28 illegitimate births in six years, or less than 1 in 100 of the total. In Turin there is 1 in 48, in France 1 in 14. The Doctor observes :—

“The Santoriniots, especially the inhabitants of the small villages, are robust in person, tall, stout, particularly the women, who have a brown complexion, chesnut hair, and are of a lively disposition, sober, chaste, religious, fond of their country, very economical, dirty and slovenly in person, the women more than the men. Their chief diet is salt fish, herbs, and barley bread or biscuit.”

With regard to hospitality, if I except our consul, I never was asked to break bread in one house in Thera, but the Greek countrymen in the villages were always ready to offer me what they had. Their houses being excavated in the pozzolana, or constructed of this material, are generally damp, and seldom see the rays of the sun. The villages of Karterado, Messaria, Vathon, and Gonia are for the most part built into the sides of ravines, which run down to the eastern coast and are almost all excavated in pozzolana and pumice. They cut the side of the precipice perpendicular and build up a wall in which may be a door and three or four windows; they burrow into the soil, arch the roof, and perhaps may have two front and two back rooms, the latter borrowing light from the former. Looking down upon these vil-

lages from Thera, all that is to be seen of them are the churches, and here and there the top of a house belonging to some of the better classes. Doctor Conte Cigalla says that the diseases are those which usually result from a hot, humid, and variable climate, acting upon robust persons, but dirty, ill fed, and ill lodged. The teeth of the Santoriniots are bad : there is scarcely a woman on the island who has not lost her teeth. Gastric fevers are prevalent, but rarely of an intermittent nature, as in the other isles of the Archipelago : in the autumn they have pleurisies and other diseases of an inflammatory nature ; the croup also is prevalent, and diseases of the skin are not rare. Near Thera to the southward there is an establishment for lepers, where there are now nine poor wretches kept as it were in a state of quarantine : there are seven or eight others in the island infected with this disease. The Doctor gives the following list of churches :—

Churches.	Greek.	Latin.	Total.
Parish	69	2	71
Conventual	40	2	42
Temple or small churches .	165	12	177
	<hr/> 274	<hr/> 16	<hr/> 290

From this number one concludes that the Greeks have one church for every 45 inhabitants, and the Latins one for every 36. Also the Greeks have one priest for every 215 inhabitants, the Latins one for 25, there being 58 Greek priests and 23 Latin. Also for the Greek church there are two convents, one of the order of St. Basilus, with 24 monks at Merovouli ; one with 15 monks upon Mount Elias for the Latin church ; a house for French lazarists in Thera ; a house of French Sisters of Charity in Thera ; a convent of 15 Dominicans in Thera ; a chapter of 7 canons in Thera.

The bigotry and ignorance of the Greeks is almost incredible. I was one day taking shelter from the sun in the house of the priest who officiated in the new church of St. Stavros at Perissa, when I fell into conversation with the company present, who were the priests Georgio of Crete and Leonardis of Pyrgo, two long-bearded, venerable, dirty old men ; also one George of Smyrna, and the Greek architect of the church. The architect said, addressing me, "The water of the well on the north side of the church has the wonderful property of making bread rise instead of yeast." I looked surprised, but the speaker was backed by the priests, stroking their beards and signifying their assent to what had been said. "My father," quoth George of Smyrna, "has a miraculous cross, which preserves its bearer from wounds and death in battle ; and, Signor," addressing me, "were you to tie that cross on a fowl's back, you might fire at it with your

double-barrelled gun and the bird would remain unharmed." I thought I had carried my politeness to a great length in listening to the miraculous power of the water, but I confess George of Smyrna staggered me, and I suppose a smile of incredulity overspread my countenance, which brought down upon my unhappy head the general indignation of the company.

The church of Stavros, to which all the people make a pilgrimage, is built upon the spot where an aged peasant working in his vineyard (as they say) found a golden cross, the value of which was estimated at 150,000 drachmæ. This poor man has now a black vestment thrown over him, having become a lay brother: the finding the cross has rendered his passage to heaven secure, at least so the priests tell him, and he believes it: however, in worldly goods he is very poor, and he bettered his existence by bringing milk and fruit to our tent. There is no longer a Greek bishop at Santorin, the island being now within the diocese of Syra. The old episcopal church is built upon one of the northern roots of Elias, and is a curious old structure of the eleventh or twelfth century: it is in the form of a Greek cross. The church is almost entirely constructed of marbles and squared blocks from the ruins of Thera or Oea. It has its fore nave or vestibulum, its nave and its sanctuary; the lintel of the grand entrance from the first to the second is of marble, and appears to have belonged to a cornice of a temple of the Doric order; from it I obtained an inscription, which I have numbered 25.

The roof is supported by fragments of ancient columns and capitals of all orders and sizes; ancient altars beautifully adorned with rich sculpture, garlands, bulls' and rams' heads, &c., form a part of this strange medley. To these rude structures of the Greeks are we indebted for the preservation of many inscriptions and ancient sculpture, as the Turks, with the exception of suppressing their bells, seem to have respected their religious edifices. The traveller will invariably find that the churches in the neighbourhood of ancient sites possess a few marbles and sometimes inscriptions. At this spot, amongst a quantity of fragments, I saw the lid of an enormous sarcophagus cut out of red lava. I am told that King Otho has robbed poor Episcopi of a great part of its patrimony to endow the new church of Perissa. The monastery of Patmos owns a great number of vineyards in the southern part of Santorin: the Greek church altogether owns at least a fourth part of the island, and the Latin about a twelfth.

I have seldom felt more pleased than I did during my visit to the school under the direction of the French Sisters of Charity. The scholars are all girls, and they are taught modern Greek and French, with the rudiments of arithmetic, geography, and history, also needlework and other useful knowledge. There is

a chapel and dispensary belonging to this establishment, from which medicines are freely given to people of all communions: the very poor get a weekly supply of bread also. Wherever I have met these good sisters, whether in Santorin or elsewhere, I have always heard them highly praised.

Dr. Conte Cigalla gives the following account of the schools:—
“There are 17 schools, with 19 masters or mistresses and 799 scholars, that is, 584 males and 215 females, or one school for 768 inhabitants, and 47 scholars for each school.”

As to the industry there is little to be said after naming the culture of the vine. A little barley, fruit, and cotton are reared, and stockings are made.

“The inhabitants,” says Dr. Conte Cigalla, “limit themselves to the trades most indispensable. The most numerous class of people, after the agriculturists and sailors, are the millers (there are 78 mills on the island), the muleteers, the porters, and the retailers of provisions and other necessities. The most industrious are the masons: there are five kilns upon the island, which produce annually 30,000 kilo* of lime, and yet they are not sufficient.”

The area of Santorin is 4335 ettare,† and is almost entirely cultivated. It is divided into a great number of small farms, possessed by 1163 proprietors, of whom only 162 pay 100 drachmæ or upwards of tax; and since the number of families amounts to 3124, it follows that two-thirds of the population do not possess land. The soil is cultivated with great care by 1190 labourers, though in an old-fashioned manner and with imperfect instruments. The price of a day's labour for a man is about a drachma, or 8½d.; the number of labouring days in a year is 250.

I am sure, from what I remarked as to the culture of the vine, that if they could be persuaded to abandon their old method, the inhabitants would reap a much richer vintage. In the first place, there are tracts of worn out old vines that yield very little; secondly, when a young tree is planted, as soon as it produces its first branches, they are all twisted up in the shape of a crow's nest, and they continue doing this with the shoots each succeeding autumn after the vintage is got in, just cutting off the tops of them. As to pruning them properly, that is never done, and the branches all growing closely together in this basket-like form, prevent the free rise of the sap and diminish the quantity of fruit. I observed, however, that all the vineyards are not after this fashion. When I have told them that I thought they were wrong, and asked why they did it, the answer was a shrug of the shoulders, and “My grandfather did so in his time.” A countryman near Emporion told me that they twist the tendrils of each

* Kilolitra ?

† Hectare ?

year's growth into the shape of these baskets until the vine has attained an age of at least fifteen years, in order to keep the fruit off the ground, having no other prop; and at that age the stem being considered large enough to sustain its burthen, they cut away the basket and leave the tree in the shape of a bush bearing its fruit well; the young vines are pruned in autumn, and have their shoots clipped in the spring; the old vines are pruned once a year, that is, in autumn. Notwithstanding the basket, I have seen much of the fruit upon the ground. The wine is of two kinds, the rough or dry wine, and the vino santo or sweet wine. The first is of a pale straw colour; Tournefort likened it to Rhenish, and I think he was correct: it has quite sufficient body and is very wholesome. When about a year old a bottle of excellent wine costs about $2\frac{1}{2}d$. All the grapes that make this wine are cut during the night. I never wished for any other while at Santorin. The vino santo is produced from the vines which grow towards the south part of the island, but not nearly in the same quantity as the other. It is generally dark red, very sweet, and luscious. I am told by judges that it is very little, if at all, inferior to that of Cyprus.

It appears to me very strange that these wines are so little known in England, for, with the exception of some which finds its way to Syra and Athens, where it is immediately adulterated and spoiled, the whole of it is taken to the Russian ports in the Black Sea, from whence in return they bring tea, salt fish, caviare, butter, oil, &c. &c. Every vine-grower in Santorin is a trader with Russia, and the shipowner also very frequently commands the ship that transports his own produce.

The following table will give some idea of an average year of produce in Santorin:—

		Value in Italian lire.
Barley	24,500 kilo	61,465
Vetches, or a sort of pea	1,840 „	9,232
Beans	750 „	4,032
Vino Brusco	53,640 { barrels, 7 of which to the pipe }	355,655
Vino Santo	2,350	63,168
Uva-passa, dried grapes	11,750 baskets	68,432
Figs	950 kilo	4,256
Cotton	4,050 okes, or $2\frac{3}{4}$ lb.	3,629
Indian corn (sesamo)	250 „	224
		570,093

The lira, assuming its value at 10*d*. English, will give for the vino brusco or the dry wine, in round numbers near 14,000*l*., and for the sum total of produce 23,755*l*. I have been informed that in the best years the quantity of wine has amounted to as much as 12,000 pipes, or 84,000 barrels; but on the other side it has been known to fall to 4000 pipes, or 28,000 barrels, and since

this table was made, a good deal of the barley land has been turned into vineyards. It is wonderful what industry has done with this fragment or crust of a volcano, which supports such a vast population. The commerce of Santorin throws into circulation annually a sum or capital of about a million and a half of drachmæ, or 53,125*l.*, assuming the value of the drachma at 8½*d.*

The tonnage of the shipping belonging to the island is 9612. There are 87 merchants and 1324 sailors. The trade is principally with Odessa and Taganrog for the exportation of wine and importation of grain; also with Syra, Constantinople and other Ottoman ports for the importation of other goods and manufactures. The imports comprehend almost everything that is necessary for life, even to wood, which comes from the neighbouring islands. The total annual sum paid into the royal treasury by Thera amounts to about 61,000 drachmæ, which is prædial or raised from the land, and in point of importance Santorin is considered to rank next to Syra and Patras: the treasury also receives a considerable sum raised from the exportation of pozzolana.

The town of Skaro, as I have before mentioned, is situated on a steep promontory of the same name, which projects into the crater under the heights upon which the village of Merouvouli is built, and it is around this promontory that the waters of the gulf are deepest. In the ruined chapel to the right of the entrance there are some ancient remains: the pedestal for the modern altar is decorated with a garland and rams' and bulls' heads, built into the wall. I observed also two headless marble statues. In the middle ages Skaro was occupied by the Venetians, who erected the castle, the remains of which still exist. Until very lately it was the seat of government. In Tournefort's day, indeed until within the last forty years, the gentry of Santorin resided there, including the Greek and Latin bishops. The following was its appearance from the opposite side of the ridge which connects it with Santorin, as described in my journal written on the spot (November 1st):—"I am now seated in front of the ducal castle of Skaro; my position is under a huge steep mass of red lava and scoria, which supports a part of Merouvouli. The promontory of Skaro is separated from me by a high ridge which connects it with the main island; its formation is striking as to colour and shape, being of dark grey, and red lava mixed up with ashes, pumice, and pozzolana; its most elevated part is a great red and black crag with a flat top rising 1000 feet above the waters of the gulf, which from time to time has been much diminished, as the earthquakes have shaken down large fragments into the sea. Around this crag are the houses of the now ruined town of Skaro, a most extraordinary group, perched one over another where a crevice in the sides of the precipice will admit of it, and in most frightful positions, the outer wall of the buildings

being in a line with the perpendicular rocks." I sprung a covey of partridges among this mass of ruins, and was once near falling into a vault full of skulls and other human bones: not a living soul now inhabits this place.

There is another strange spot in which the human race have built their nests. Epanomeria is situated on the face of the cliffs of the N.W. promontory of Santorin, and directly opposite to Therasia. No one, on approaching it from Thera by land, would dream that he was riding over a town containing upwards of two thousand inhabitants. I passed on to the western extremity and ascended a square Venetian tower, which at the time of Choiseul Gouffier's visit in 1772 was part of a castle: it is elevated about 600 feet above the level of the sea, and immediately over the port of St. Nikolo. Seated on the top of this structure, I had an excellent view of the town, an amphitheatre of houses built into a deep stratum of pozzolana or tufa, which is of a brownish-white; the houses are piled one over another from fifteen to twenty deep, the whole surmounted by numerous windmills perched on the very top. Many of the dwellings are excavations in the cliff, others are built above them, some with arched roofs, others flat, the lower tier full 400 feet above the deep waters of the gulf; the strata below are perpendicular, and of a bright red and black lava, much calcined, and scoria. A thunderstorm swept over the southern half of the crater whilst I was there, and the noise reverberating round the steep sides of this vast volcano, had a fine effect. I was told by the owner of the tower, Antonio Sorotas, that it was built by the Venetians; but over the door I found a stone having a spread eagle sculptured, with the date 1630. On my inquiry for antiquities I was shown a fragment of marble with the characters ΑΓΓΕΛΟΕ upon it.

Epanomeria is approached from the sea by a zig-zag road cut into the cliffs, the same as that at Thera, and, to a stranger sailing into the crater, has a very striking appearance, the houses towering on high far above the mast-heads of the largest ships; but at night the voyager would hardly be aware of the presence of a town, were it not for the twinkling lights along the face of the cliffs and the windmills on their summit, which show out in relief against the sky. Pyrgos is to the S., and is built upon and around a conical hill of pumice and pozzolana, with a limestone base, being one of the northern roots of Mount Elias. It has about 1500 inhabitants. It is astonishing that so many people can live in such a small space; the Greek and Latin bishops had houses here; the Episcopal Greek church is only about three-quarters of a mile to the eastward.

The town of Emporion, which is situated on one of the southern roots of Elias, is very neat and clean, and a great many

respectable land proprietors dwell there. This place derives its name from the circumstance that at one time it was the residence of most of the merchants and vine-growers. Near it to the W. is a remarkable-looking square tower, probably of Venetian origin; it belongs to the monks of Patmos, and has served as a sort of *motokhi* to them. A great deal of the surrounding land belongs to their monastery; it produces the *vino santo*, or sweet wine. I observed a piece of marble, bearing an inscription, built into the S. wall of this structure, but it was too high to get a copy of it. Emporion has 1380 inhabitants; $2\frac{1}{2}$ miles to the W. of it is the bourg of Akroteri, numbering 524 inhabitants; it is built on the side of a hill, and is distant from the cape of the same name about 2 miles. The land at Akroteri is high, and the distance across from sea to sea only $\frac{1}{4}$ ths of a mile; the cliffs on the crater side are very steep, and those to the S. are composed of huge heaps of black ashes, cinders, and, in places, pozzolana; they are much furrowed and broken.

During the months of June and July we found the range of the thermometer from 77° to 85° : the hottest part of the day being 2 P.M., and the coolest 4 A.M. The prevalent winds were from the N., blowing at times with great violence; certainly more than half the above months it blew from that quarter, and the people say that they are very injurious to the vines. It is the general opinion in Santorin that the coolest winds in summer and the coldest in winter blow from the S., coming from the neighbouring snowy mountains of Crete. The range of the thermometer at Thera, the last 15 days in October, was from 62° to 80° . In the winter months, I was told, that in Thera it is very cold, and snow is frequently known to fall. Dr. Cigalla gave me the range from 6° to 14° of Réaumur in that season.

I know of few useful plants in Santorin. The lichen *Rocella Tinctoria* (so plentiful in Mykoni, and so valuable as a dye) I searched for in vain. The litmus is prepared from it; and unless blue cloth has first been dyed with litmus, and afterwards with indigo, the seams will turn white, and the colour fade. Dr. Cigalla names the saffron, the maritime squill (wormwood, assenzio), coloquintida, rue, lichen-*Islandica*, sage, rosemary, chamomile, pellitory, mallows, dog's-grass or dog's-tooth, capelvenere or maiden's-hair, &c., as medicinal plants which grow here.

At Exoniti I have seen some beautiful specimens of the lily, and a great variety of thistles. Of the fig I am told there are fifteen kinds, and of the vine fifty; in some gardens they have the pomegranate, the peach, the apricot, and the plum. The cotton here is good (*Gossypium arboreum*); the tree on which it grows lives to a great age, as the vines also do. Firewood is extremely dear, being brought over from the neighbouring islands.

Almost all kinds of fruits and vegetables are brought from Naxos. Hydrophobia is very rare. There are no reptiles.

As to the antiquities of the island, Père Richard, Choiseul Gouffier, Blum and Professor Ross, particularly the last-named, have left but little more to be said.

We learn from Herodotus (iv. 148) that there were seven districts (*χωραι*) in the island, and there might be as many towns, though he does not say so. The names of two cities have been preserved by Ptolemy—Oea and Eleusis. It appears from the inscription, which I have numbered No. 26, that there was a city, Thera, on Messa-Vouno: "Artemidorus has erected this statue in honour of Hecate of a thousand names, Goddess surrounded by light, and honoured by all the inhabitants of the country; the same Artemidorus, in order to leave a monument to the city of Thera, has cut these stairs for the convenience of passengers, and placed the statue, which is in black stone." Strabo also mentions a city, as having the same name as the island. On mule-back from the scala of Thera to the foot of Messa Vouno (or St. Etienne, or St. Stephen, as it is indifferently called) it is about two hours' journey, although the distance is not more than 5 miles. The first time I visited that part of the island was in July, starting from Thera a little before sunrise. The road is a gentle descent between walls built of lava and basalt, and passes through the villages of Karterado, Voumitza, Messaria, Vathon, and Gonia, the last of which is built upon a root of Mount Elias. Vineyards lie on all sides. At Vathon the limestone begins to show, and the walls have a considerable quantity of it in their composition. As I have before observed, all these villages (having an aggregate population of 4900 souls) are built into the sides of ravines which run from W. to E., and have been formed from time to time by the rains making channels in the pumice in their way to the sea. That in which Vathon is built is perhaps 50 or 60 feet deep, and of considerable width; it has a garden and trees in the centre, also a pretty church, at the W. end of which is a large sarcophagus, from which I took an inscription, which I have numbered 38. In no island of the Grecian archipelago does the stranger meet with so much courtesy as from these simple people. On approaching Gonia fragments of ancient remains present themselves, such as headless statues, built into the walls, squared blocks of red and black lava, and now and then pieces of pottery mixed with the soil. Nikolo Scopoteles, the chief man of the place, pointed out to me the inscriptions, which I have numbered 36, 37, 38, 39, 40. Pursuing a S.E. direction, we arrived at the black sandy beach of Kamari. Here, in the church of St. Nikolo, which is immediately under Messa-Vouno, I copied the inscription, which I have numbered 8. It is

on a pedestal or fragment of a column, which supports the altar ; the word OIA appears in it. Here commences the ascent to the Sellada, which connects Messa-Vouno with Mount Elias : it is very steep, and plentifully strewn with pumice. From the summit the plain to the S.W., between Perissa and Emporion, spreads out before the eye, entirely cultivated with the vine ; beyond it is the sea, and, in the horizon, Ida and the other mountains of the Cretan range. After enjoying the prospect the traveller must turn to his left, and taking an easterly course up a steep, rugged zig-zag path, he will shortly find himself on the summit of Messa-Vouno, the site of the ancient city—a most noble situation. The mountain may be about 1100 feet above the level of the sea ; the summit is like a crescent presenting its convex side towards St. Elias and the plains of Perissa ; it slopes suddenly off to the precipices on the N.E. side, which rise perpendicularly about 600 feet above the water, and form the cape of the same name as the mountain. Around the crescent were built the walls of the city, which do not appear to have extended along the edge of the cliffs over the sea ; they are of all orders of masonry, from the Cyclopean, composed of rude masses of many tons weight, piled one upon the other, with small stones fitted in between the larger, down to those of the regular masonry of a later age, and there are even some kinds which lead one to believe that this city was inhabited late into Christian times. The city could not have been of great extent, as the circuit of the walls is not more than seven-tenths of a mile ; it must have been built terrace fashion on the slope of the hill, within the crescent, and is at the present time little better than a shapeless mass of ruins. The stairs cut by Artemidorus, where he erected the statue to Hecate, are on the N. side. Many fragments of columns are strewn about, half buried in the soil, and the rocks on the S. side have many inscriptions, some of which were illegible to me.

The monks of the order of St. Basileus, in the convent upon St. Elias, who now lord it over the remains of ancient Thera, depute their authority to two simple peasants. These men cultivate a few figs, barley, and vegetables, and drive their flocks amongst the ruins of the city.

Towards the lower part of the site is the *metokhi*, or farmhouse, which receives the slight produce of the mountain, and adjoining it is the church of the Evangelists. Both are built of ancient marbles ; indeed, the first appears to have preserved intact the lower part of an ancient structure. Immediately opposite is a marble hexagonal building or platform, upon which Olivier thinks there was a statue, perhaps of Marcus Aurelius or Antoninus. Thence descending by a winding path a narrow glen which runs in a N.E. direction, we arrive at a most singular her-

mitage, built into the face of the cliff overhanging the sea. It is now uninhabited; the last hermit who resided there, a religious visionary, was sent away by the late bishop to end his days in Skiathos, his native isle.

Fragments of vases are strewn all over the site. It is necessary to be cautious about falling into the numerous cisterns cut in the rock to catch the rain. I procured from the brothers Barbacousi the medals which I have numbered 1, 18, 19, 20, in my list of coins of the island; No. 14, which was given me by a gentleman of Thera, also came from this spot. An ithyphallus with the inscription "To my well-beloved," proves that Priapus was worshipped in Oea, if these are the ruins of that city.

On the W. side of the city are three small Greek churches; two of them are built in one, and occupy a level piece of ground to the left, as one ascends from the Sellada. One is that of St. Stephano, the other St. Etienne; these churches are probably built upon the site of an ancient temple, the marbles of which have been used in their construction. The other, that of the Transfiguration, is a little more to the S.; it is cut into the rock or side of the mountain, and has been an ancient tomb or temple; there is a small spring of water in it. To the right of the door is an inscription nearly illegible; to the right of which again is a deep niche cut in the rock.

Descending to the tombs in the rocks below, by the only road by which it is approached, we find ourselves once more on the Sellada, and on every side are the tombs of the ancient inhabitants.

Sarcophagi cut in the rocks on the side of Mount Elias, and also of Messa-Vouno, are still visible, though some of them have been shaken down by the violence of earthquakes. There are other tombs near the summit of the connecting ridge, which have been sunk into the soil; they have all been opened, and many vases and some coins were found in them. Also, the N.E. side of Mount Elias has been cut in places into many flights of stairs. I counted fifteen steps in one place, leading up to a row of small round and square basins, cut into the uppermost one. These basins are fitted to receive lids, and I suppose at one time contained the ashes of the dead.

On the south side of the Sellada to the right, as we descend towards Perissa, and in a steep part of the mountain, are three tombs, one below another: the first, 5 ft. 6 in. by 1 ft. 6 in.; the second the same size; the third, a few steps lower, probably that of a man, 5 ft. 10 in. by 1 ft. 10 in. To the right, on a ledge, are five circular basins, and below is a platform or oblong square, 9 ft. 6 in. long by 6 ft., in the centre of which is a large round basin, and at two of its corners a square one. To the left of this

is another round and a square basin. This platform is approached from below by three steps. Professor Ross has published a plan of a sarcophagus which is near this spot, and, together with the prodigious rock in which it is cut, appears to have been shaken down by an earthquake. This learned traveller mentions that inscriptions have been found in this neighbourhood cut upon blocks of basalt, the characters of which belong to the epoch of the first immigration.

From the Sellada to Perissa the descent is not so steep as it is on the northern side: vast beds of pumice and pozzolana are lodged upon the limestone slopes of the mountain. Two headless marble statues lie in the track, which have been most likely precipitated from the heights above; and nearly at the bottom are two others, one of a man, another of a woman, built into the walls which inclose the vineyards. Half an hour from the summit brings us to Perissa.

The quantity of ancient remains about Perissa would incline us to believe that it is the site of a city. It is close under Messa-Vouno, round the foot of which, before the eruption of 1650, there was a road from one place to the other. All the people, old and young, bear testimony to this, and say that it has been handed down to them. During that eruption, a great part of the east side of the island sank to the extent (the narrative says) of 500 acres of land; and where the road then was, there is now water. The soundings round from Perissa to Kamari, the oars nearly touching the rocks, are 1, 3, 5, 5, 12, 14, 10, 9, 64 fathoms; the distance is about a mile and two-tenths. The precipices that form this cape are nearly perpendicular, and about 700 feet high. The soundings off it run gradually out to near two miles, where we had 135 fathoms; in fact, they are nearly in the same ratio all along the eastern shore of Thera.

I have before said that the Greeks have built a church at Perissa, which they call St. Stavros. It is upon the site of an ancient temple, perhaps of Roman times, and certainly a larger edifice than they can ever require in this spot, so distant from most of the towns of the island. Professor Ross says that this church was built in consequence of the dream of a visionary, in which it was revealed to him that the ruins of a convent lay buried on this spot. However this may be, the earthquakes attendant upon the eruption of 1650, according to Père Richard, uncovered ruins here not previously known to exist. In clearing away for the new buildings, many inscriptions have come to light; also baptismal fonts in marble, with the cross and a dove or a cock sculptured on each side. I pitched my tent here, in order to search the surrounding country for inscriptions, and the heat under canvas in July was very great. At the east end of the new

church, but not connected with it, is the ruin of a circular Hellenic building of bluish marble, having three or four courses of regular masonry remaining. It is placed upon a platform, to which we ascend by four low steps, from which the soil is partly cleared away. Professor Ross conceives this to have been a *heroum* or tomb, and supposes it to have been erected to Eraskleia, daughter of Eratokrates; and grounds his belief that it was so upon an inscription lying near (No. 17). Round the outside of this church are many inscriptions much worn; I managed to get an imperfect copy of the one, No. 42. Nearer the side of the mountain are the ruins of another temple, upon the floor of which is constructed the small church of Panagia Irene. Many of the columns are scattered about; they are of the Doric order, and of no great size or antiquity. A lime-kiln there will probably destroy a few more of these marbles. Near our tent was an ancient well of brackish water; the brink was cased with white marble: and at a few minutes' walk into the plain, towards Emporion and Platanimos, I was shown two headless statues of a man and woman in white marble, which appear to have ornamented the portico of a temple. The man is reclining on his left side; the head was raised, and supported by the left hand; the woman is sitting with her back to him, and partly reclining against him. His right arm is thrown over her shoulders. The execution of this group seems superior to any I had yet seen. On a large block of basalt, in a vineyard near, I observed some ancient characters, but too faint to be copied.

At a short distance is the small church of St. Adonis, near which is a large ancient well with brackish water. Going to the S.W., a few minutes bring us to two other large ancient wells of tolerable water. They appear to me to be cut in the limestone, after perforating the thick layer of pumice which covers all the plain of Perissa, and in which the vine flourishes. From these wells to Cape Exomiti and the S.E. slopes of Mount Platanimos, it is about a mile and a half; and to that locality has been assigned by some the site of the city of Eleusis, mentioned by Ptolemy. The rock tombs cut in the S.E. side of the mount, the remains of the mole under water on the W. side of the cape which formed the port, also the existence of fragments of pottery, are sufficient evidence that a city stood here, which may have extended some distance into the plain towards Perissa. It is also not improbable that a part has been swallowed up in one of the convulsions to which this island has been subject.

The mole to the S. stretches from the cape about four-tenths of a mile to the W., and is slightly curved in order to meet that to the N., which is shorter; the greatest depth of water inside is $3\frac{1}{2}$ fathoms. I was amused one day by my Greek interpreter

bringing me information that he had received from the inhabitants of the country, that there were houses under water here, and that in calm weather their chimneys were to be seen. I wonder whether, in sounding, our lead ever intruded into the kitchens of the inhabitants of ancient Eleusis!

The tombs above mentioned are well worth visiting, and are considered to be the work of a very remote age. I was not aware of the visit of Professor Ross to this spot until my return to Malta; and I find that his companion, Mr. Schaubert, has made some very correct plans of them. Ross conceives that the pilasters forming part of two of these tombs, are an early specimen of the Corinthian style; if so, this would rob Callimachus of Corinth of a part of his laurels, who, according to Vitruvius, was the original inventor. I am more inclined to think that they represent an early species of the Ionic, as the capital bears so very small a proportion to the length of the shaft, and the volutes or scrolls are very similar to those of that order.

I shall now describe the most elegant of these tombs; it is the one nearest the cape, and cut in a perpendicular part of the mount. This semicircular niche, at a distance, has the appearance of an entrance or porch of a small temple, composed of a pediment and plain entablature, supported by two small pilastral columns, nearly approaching to the Ionic order. These columns have no pedestals, but stand upon the base of the tomb, which is elevated above the ground some three or four feet. The niche itself is about 3 ft. 6 in. in depth, 7 in. in height, and 5 ft. 9 in. in width or distance between the pillars. The lower part is occupied by a sort of ledge elevated above the floor 2 ft. 10 in., into the upper or horizontal surface of which is cut an oval basin 3 ft. 9 in. long, 1 ft. 6 in. broad, and 10 in. deep. This trough has been fitted for a lid. The columns of this little edifice are 7 ft. high, without the capital; they measure 10 in. in diameter at base, and 9 in. at the neck, a circumstance unusual with pilasters. They stand out from the rock $1\frac{1}{2}$ inches, and are without flutings. Their capitals are, I am inclined to think, an early specimen of the Ionic, and are about 9 in. high, or one diameter of the neck of the column, which is more than an Ionic capital should have. They consist of nothing more than the volutes (with no ornament between), upon which the abacus and architrave rest; the former is cut inwards, or arched something like the modern Ionic, and has no ornament. The acroterium is placed at each angle of the pediment, according to the Professor's plan; but I could not perceive them, neither did Lieut. Mansell. The most ancient Ionic columns, according to Vitruvius, had an elevation equal to eight diameters; and in more modern times, he says architects have allowed eight and a half; these pilasters have rather

more than eight. According to Mr. Schaubert's plan in Ross's pamphlet, the entablature of this tomb is only about a seventh of the height of the columns. The regular ancient entablature was one-fourth of the height, and it was afterwards reduced to a fifth. I make the one in question nearer to the last proportion. It has been split down the centre by the shock of an earthquake. I recollect, in 1844, when on my way from Delphi to the summit of Mount Parnassus, I saw a rock tomb something similar to this one, and rent in twain in the same manner.

Near this spot is a sarcophagus hewn out of the rock, having all its sides projecting, except that which is attached to the mountain. It has a false lid, apex-shaped, and the corpse was put in through an entrance close to the rock, which was covered by a flat stone. The height inside is 2 feet 3 inches; length, 6 feet; breadth, 2 feet. Above it, on the rock, is sculptured in bas-relief a serpent about 7 or 8 feet long: the inhabitants call it the Ekhendra. Above it is another sarcophagus hewn out of the rock, also without a lid, which bears in large characters the inscription ΘΕΟΘΕΜΙΟΣ. A short distance to the N., and on the eastern face of this hill, are two other tombs or monuments of the same kind; they are close together, and the central pilaster serves for both. The one to the left has only an acroterium on the upper angle of its pediment, while the one to the right has one at each angle. These excavations appear in front to be square compartments, with three pilasters supporting two pediments; they are rounded at the back, and have seats, but I could find no spot for the deposit of body or ashes. The height of the shaft of the centre pilaster is 6 feet; that of the capital is 8 inches diameter, at the base, 9 inches: none of these pilasters have pedestals. The one to the right has been destroyed by time; the other two are tolerably perfect. These niches are elevated about 12 feet above the ground, and do not appear to ever have had steps in the rock whereby to ascend to them.

A few paces to the N. is another tomb, the same height from the ground, and as difficult of approach. At a distance it has the appearance of a large square excavation, with three steps one above another. On clambering up, I found within, upon the first step or shelf, a place for a body 6 feet in length; it is rounded out at the north end to accommodate the shape of the head and shoulders, and narrows gradually towards the feet. It was fitted with a lid, which had been cemented down, and some of the cement still adhered. I also think the corpse was otherwise secured by a bar passed over the lid, there being holes in the rock for such a purpose. The other two ledges were cut full of round and square basins, which Professor Ross conceives may have held busts or statuettes; and he adds it was on this spot that the statue of Apollo

was found. There are other niches along the side of this hill, but I have mentioned the three principal. Nothing has turned up to identify this spot with the city of Eleusis.

About seven-tenths of a mile due E. of the town of Emporion, and one mile and two-tenths S. of Megalokhorio, there is a little marble church situated in the midst of a vineyard; it is called Hagios St. Nikolo Marmaretes. All the marbles of which it is constructed were removed from Messa-Vouno or its neighbourhood, where they formed an edifice of the same shape as that we now see, an oblong square. In fact, it is a small ancient temple or tomb, removed from one place to another. I made a sketch of the front of this building, which I copied from a drawing in Ross's pamphlet. The length is 14 feet, and breadth 12 feet; height, 8 feet; the marble of which it is built is greyish blue, the same as that of which Messa-Vouno and St. Elias are formed. The roof is also of marble, having three beams which traverse the entire breadth, the intervals between which are filled up with small pieces at right angles. Directly opposite the door, which is to the S., a semicircular niche of small dimensions is let into the wall. On each side of it is a beautiful little fluted Ionic column, 2 feet in height, supporting an entablature and pediment, under which is a marble sacrificial basin. Also, on a stone in the wall under this basin, is an inscription which I have numbered 18; which, being covered with whitewash, I did not immediately detect, but after washing it with a bunch of grapes, I could read it tolerably well. The learned Professor just mentioned, supposes this building also to have been another *heroum*, and gives in his plans all the details of it; such as the inner cornice, the elevation of the north wall, the door jambs, lintel, and the moulding under the niche which is over the inscription. &c. The inscription itself he considers to show that this monument was founded by Epilunchos and Panarista, in honour of some goddess; and he conjectures that it may have been either Venus or Cybele, for an inscription in Thera shows that Cybele was worshipped by the people of that isle (No. 33). However, my copy of it differs in a few letters from that of the Professor.

It will appear, by what has been said, that the site of the city of Thera is pretty clearly established; and that the position of Eleusis at Cape Exomiti seems probable. But where was the city of Oea, which existed so late as the time of Ptolemy? Could it have been to the N. of the isle, in the neighbourhood of Cape Kolumbo, or on the S. side of the ridge which terminates in that steep black cape? I visited some ancient tombs there, excavated in the volcanic strata. They are after the fashion of those at Milo. The spot was called by the inhabitants Keglia. One of these chambers I found to contain about eight sarcophagi

for bodies; the size of the place might be about 20 feet square. I found in it an old gipsy woman cooking her pottage, and she did not seem very well pleased at my abrupt entrance. The roof of the chamber had been stuccoed and painted. To the right were three sarcophagi, two single and one double; to the left were three more: at the end opposite the door were two at right angles with the others, above which, in the side, one was cut for a child. I entered several others of the same kind on the side of this hill. Crossing the ridge, and examining the churches of St. Constantine and Santa Elene, I perceived large squared blocks of lava and basalt; a Doric capital: the holy table of one was supported by an ancient altar, adorned with a garland. All my researches for inscriptions were fruitless, and my inquiries among the country people for them, and also for medals, were invariably answered by pointing towards the south or Messa-Vouno. The Red Mountain, or Kokino-Vouno, rises abruptly from this spot in the shape of a cone. Its height is 1100 feet; the lower slopes are cultivated with the vine. I could not find a trace of an Hellenic wall, but near the sea are the foundations of houses of the middle ages: Oea might have stood here. The only other likely spot that I know of for its site is in the district of Kamari; and when the earthquakes of 1650 took place, which swallowed up so much land on the E. coast, it is not unlikely that many ancient remains were sunk in the sea. The tradition on the spot tells us that a city is under water near that shore; added to which, Père Richard also informs us that some ruins were uncovered there at that time.

Two miles and two-tenths due N. from the slopes of Messa-Vouno a limestone rock called Monolithos rises out of the pumice. Its height is 100 feet, and its distance from the shore less than two-tenths of a mile. On its S. slope is built a church dedicated to St. Ionanni Prodromo. I was unable to detect any ancient remains in this church, but passing S. one mile and three-tenths, I arrived at Hagios Georgios, and from a stone over the door, 1 foot 9 inches in length and 6 inches deep, I copied the inscription No. 19. Also in a field close by, upon a square blue marble pedestal, I found the inscription numbered 22. This pedestal is 2 feet 9 inches in height; the letters are on the west side, and occupy a space 1 foot 2 inches high by 2 feet 1 inch broad: the top of the pedestal has been hollowed out to receive the sandalled feet of a statue; the length of the feet is 1 foot, and the statue was therefore of large proportions. There are the remains of an Hellenic wall of regular masonry: a few feet to the E. of it, in a vineyard near, I was shown the headless bust of a man dressed in a toga, the right arm thrown across the breast: it is of beautiful Parian marble and the size of life. Upon the flat part underneath, or where it would rest upon the pedestal, are the

letters AE BI. Round this spot, and as far as the slopes of the mountain, are many fragments of ancient marbles built into the walls of the vineyards. It was in a cave one mile to the E. of Hagios Giorgios and near Gonia that I found the inscription No. 40; and in Gonia itself those given in the appendix.* At the church of St. Nikolo at Kamari I have already noticed the inscription No. 8 with the word OIA in it, which, according to the Abbé Pegues, runs thus:—"The members of the sacred gymnasium of Oea consecrate this monument to the honour of the rhetorician Olus Plotius Satyrus, son of Olus Plotius Leonidas, asiarch, brother of Olus Plotius Theodorus *basitarch*, benefactor of his country, to him and his ancestors."

This church of St. Nikolo is immediately under the steep sides of Messa-Vouno, and it is possible that the marble bearing the abovenamed inscription was thrown over from its summit. However, at the same time, near the same spot, are fragments of a temple of the Doric order, which, together with the remains already named, and the tradition that there is a submerged city off this shore, and a little to the N., incline me to believe that Oea stood below and to the N. of Messa-Vouno, and not on it, as Professor Ross supposes; and in this opinion I am not singular. The Greek Government fixed upon the N. end of this island for the demarchy of Oea, upon what evidence I know not. At first it had four demarchs, though now but two: it is difficult to come to a conclusion on this point, notwithstanding the inscription.

Père Richard, on Santorin, Paris, 1656, says:—

"Under the mountain of Messa-Vouno one sees the ruins of a beautiful and ancient city; it is a prodigy to behold the size and thickness of the stones of which the walls are built; it must have required strong hands and arms for their manufacture. Among these ruins are found beautiful columns of marble quite entire; also rich sepulchres, which were they entire would yield to none of those of our kings; many marble statues are thrown upon the earth sculptured after the Roman fashion. One reads at the present day upon the pedestal of the statue of Trajan beautiful eulogies in Greek upon that puissant emperor, as also upon that of the statue of Antoninus, from which we conjecture that this city was very considerable, since the emperors of the world there received honours worthy of their majesty; also it was governed by two consuls, as a noble republic. The churches one finds are built of beautiful marble, which, with a quantity of sepulchres cut in the rocks, and many foundations of houses, give one to understand the nobleness of this isle."

Where this city mentioned by Père Richard as under Messa-Vouno could be I know not; if it were upon Messa-Vouno and under Mount Elias I could understand, more particularly as re-

* In the Appendix to the Author's MS. Ed.

gards the massive walls and inscriptions: on the other hand, it must be remembered that this Jesuit missionary wrote at the time of the eruption off Kolumbo in 1650, when the ruins at Kamari and Perissa were uncovered by the earthquakes, and which were perhaps afterwards swallowed up.

No traveller has yet been able satisfactorily to assign a site for the cities of Ptolemy, and it is a matter of mere speculation. In all probability Oea was a little N. of Messa-Vouno, and Eleusis at Cape Exomiti. The Russians, when they ravaged these seas in 1770, took away from Thera many valuable antiques, but I fear they never reached the museum for which they were intended, as I believe the vessel in which they were embarked foundered at sea near Gibraltar; after them came the French with little better success: their vessel also suffered shipwreck.

Villoisin mentions that during his stay at Santorin in 1786 he saw at the house of the Lazarists a superb marble statue of a young man which had been found near Exomiti by Antony Delenda whilst cultivating his land. It afterwards became the property of Louis XVI. of France. Monsieur de Fauvel, Consul of France at Athens, many years since, found on Messa-Vouno a beautiful marble statue of a mother nursing her child. A peasant pointed out to me the spot from whence it came. Amongst the Russian spoils was an infant and cradle chiseled out of the same block, and said to have been of exquisite workmanship.

I have thus endeavoured to give a description of this curious volcanic group, though what I have written is little more than a compilation from other works, for the most part written in Latin, French, and Italian. The soundings, height of mountains, and sketches of walls, &c., have been taken from Lieut. Mansell's admirable chart of the place, constructed last summer (1848), a glance at which will give a good idea of this wreck of a once beautiful island.

Before concluding I must again advert to the shoal, the edge of which is two-tenths of a mile E. of Mikro-Kaimeni Island, and over which one passes on his way thence to the small port of Thera. My attention is recalled to this subject by an extract from the *Edinburgh New Philosophical Journal*, No. 41,* in which it is mentioned that Monsieur Theodore Virlet had addressed a note to the French Academy of Sciences, directing the attention of geologists to the probability of the speedy appearance of a new island in the Grecian Archipelago, in consequence of the progressive rise of a sunken solid rock (composed of trachytic obsidian) in the gulf of the volcano of Santorin. The following are the author's observations on this subject:—

“Towards the end of the last century, at the period when Olivier

* P. 175; see also No. 42, p. 200 MS.

visited Santorin, the fishermen of this island asserted that the bottom of the sea had recently risen considerably between the island of Little Kaimeni and the port of Thera; in fact the soundings did not give a greater depth than 15 or 20 fathoms, where formerly the bottom could not be reached. When Colonel Bory and the author visited the island in 1829, they were not only able to confirm the truth of Olivier's statement, but also to ascertain, by various soundings, that the rise of submarine land had continued, and that at the point indicated the depth was not more than 4 fathoms and a half. In 1830 the same observers made new soundings, which enabled them to determine the form and extent of the mass of rock, which in less than a year had been elevated half a fathom: it was found to extend 800 metres from E. to W., and 500 from N. to S.

"The submarine surface augmented gradually to the N. and W. from 4 to 29 fathoms, while to the E. and S. this augmentation amounted to 45 fathoms; beyond this limit the soundings indicated in all directions very great depth. I have lately been informed that Admiral Lalande, who since 1830 has twice returned to Santorin, ascertained that the rock still continues to rise, and that in September, 1835, the date of his last visit, the depth of water amounted to only 2 fathoms, so that a sunken reef now exists which is dangerous for brigs to approach. If the rock continues to rise at the same rate, it may be calculated that in 1840 it will form a new island, without, however, those catastrophes which this phenomenon seems to presage for the gulf of Santorin, being a necessary consequence of the epoch of its appearance at the surface of the water. Since the eruptions of 1707 and 1712, which produced the New Kaimeni, volcanic phenomena have completely ceased in the gulf of Santorin, and the volcano seems at the present day quite extinct. Nevertheless, the rise of a portion of its surface seems to demonstrate continued efforts to make an eruption during fifty years; and that, whenever the resistance shall not be strong enough to offer sufficient obstacle, the volcano will again resume its activity.

"Some little distance to the S.S.W. of the Little Kaimeni, the bottom of the sea rises, and the lead indicates no more than 15 or 20 fathoms; but this bottom is of stone or rock, on which a ship cannot anchor. The fishermen belonging to the island affirm that it has risen considerably within a short time, which seems to indicate the approaching formation of a new island."

A line drawn upon the chart of Santorin in the direction mentioned by Monsieur Olivier, that is, S.S.W., carries one immediately into from 100 to 150 fathoms water, probably, therefore, it is a mistake, and that point of the compass should be changed to E.N.E., which direction will take a vessel from the S. end of Little Kaimeni over the 4-fathoms shoal and the 20-fathoms shoal to the scala of Thera. The edge of the first named is not more than two-tenths of a mile from Mikro-Kaimeni, with a depth of water, between, of 50 fathoms; it is no doubt a sunken cone, its summit measuring about eight-tenths of a mile round the most elevated part within this circumference, having but 4 fathoms

water on it, and the least elevated about 14. Immediately outside of the 14-fathoms line there is deep water all round. As to anchorage, I saw a large Austrian bark in October (1848) ride out a strong north wind upon it: the bottom is rock and sand. Steering towards Thera from this, two-tenths of a mile will place a vessel on the 20-fathoms shoal (intermediate depth of water being 70 fathoms); this also appears to be a cone somewhat smaller than the other, and steep all round; its eastern edge is six-tenths of a mile from the scala; therefore may not the 20-fathoms bank be the one reported by the fishermen to Olivier, and may not that one having now but 4 fathoms upon it have existed at the same time, whereby a mistake may have arisen that the former has within the last half century approached so much nearer the surface of the water? The difference of the depth of water, viz., half a fathom, between the two visits of Monsieur Virlet I consider as nothing; a small rise and fall of the water will account for that, and eighteen years having intervened since that gentleman's second examination and the time of Lieut. Mansell's careful survey without any difference in the depth of the water, dispels for the present the idea that the island of Santorin is about to be visited with another eruption, at least in this part of the gulf. As to Admiral Lalande finding but 2 fathoms, it is to me unaccountable, and I should be glad to see that officer's official report. I have several times passed over the spot in calm weather, and could see the bottom in every part.

It has been advanced by some, Olivier and Von Buch amongst the number, that all the calcareous part of Santorin, which forms the greater part of its southern moiety, and which, from all I can ascertain, is about 10 miles in circumference, was originally an island of only that extent; that, secondly, an eruption took place perhaps in the part now occupied by the Kaimeni Islands, and formed Callistê, of which Therasia and Aspronisi were a part, having a cone in its centre with a crater, which, judging from the conformation of the land that remains, might have been some 2500 feet above the level of the sea; that, thirdly, a sudden and extraordinary depression took place in the centre of that island, from which has resulted the gulf, or else that the centre of the island was overthrown by another and more violent eruption, and hence the present crater; and the fourth period or change was the formation of the three islands which successively rose from the bottom. As it is impossible to foresee what ultimate changes may take place in a volcanic region like this, perhaps all these islands may again be united, and the crater at present filled with water may again become dry land.

Humboldt observes in his '*Cosmos*'—

"Of all islands of eruption belonging to volcanic chains, Santorin

is the most important as an object of study; it is a complete type of islands of elevation: for more than 2000 years, or as far back as history or tradition enable us to trace, efforts of nature to form a volcano in the middle of the crater of elevation, seem perpetually to have been going on."

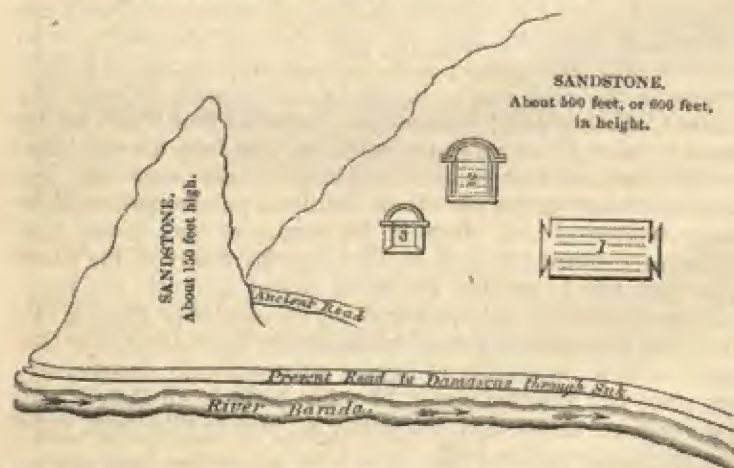
II.—*On the City of Abila, and the district called Abilene near Mount Lebanon, and on a Latin Inscription at the river Lycus, in the north of Syria.* By JOHN HOGG, M.A., F.R.S., Hon. Secretary.

[Read June 25, 1849.]

THE position of *Abila*, and of the territory called *Abilene*, in *Cœlesyria*, or the north of *Syria*, has never, I believe, been determined with certainty; and the same has been rendered more doubtful in consequence of there having been two, or three, other cities bearing that name; all of which, however, were situate further to the south in *Syria*.* I now beg to submit to the Royal Geographical Society a Latin inscription, from which the proximity of the former will be fairly inferred, and the locality of the *Abilene* district be accurately settled.

In October, 1843, Charles Lempriere, Esq., a Barrister of the Inner Temple, travelling between Baalbec and Damascus, observed two Latin inscriptions, which he copied, and which he has kindly permitted me to examine and endeavour to interpret.

The following is a copy of a rough sketch made by that gentleman on the spot where the inscriptions were noticed:—



* To show that uncertainty still exists as to the site of the *Abilene* of Lysanias, I may here state what Capt. Lynch, in his recent 'Narrative of the Expedition to the

The large tablet, No. 1, contains these lines as transcribed by Mr. Lempriere.

IMPCAESMAVRELANTONINVS AVGARMENIACVSETIMP
CAESA VRELVERVSAVGARMENIACVS
VIAMFLVMINISVIABRVPTAMINTERCISOMONTE
RESTITVERVNTPERIVLVERVMLEGPRP
PROINC SYRETAMICVMSVVM
IMPENDIISABILENORVM

In the fourth line, and the beginning of the fifth, I should read PER IVLIUM VERVM LEGatum Pto Prætoribus PROVINCIE SYRIÆ; the emperors themselves bearing at that period the title of Proprætors, Julius Verus was their *Legate*, or deputy. The word PROINC, as transcribed, is clearly imperfect; either the letter V after the first three has decayed and been worn out by time, or else the fourth letter I, has been cut V, and so abbreviated for VI.

I would therefore translate the inscription thus:—

“The Emperor Cæsar *Marcus Aurelius Antoninus* Augustus Armeniacus, and the Emperor Cæsar *Aurelius Verus* Augustus Armeniacus, restored the road broken away by the force of the river, the mountain being cut through by the agency of *Julius Verus*, the Legate of the Proprætors of the Province of Syria, and their friend, at the expense of the inhabitants of *Abilene*.”

The second inscription, which is preserved in the tablet No. 2, exactly as copied by the same traveller, is the following:—

PROSALVTE
IMPMETERIMVO
LVSIVS MAXIMVS
7LEGXVIF
QVIOPERIINSTITITVS

Here the second line is somewhat obscure; and I think that before the letters ERI a V has perished (as in the former inscription); or they may have been originally written VERI, meaning VERI, the portion represented in dots having decayed. I propose to interpret it in one of the following ways:—

First, IMPERATORUM MARCI ET VERI; i. e. ‘of the Emperors *Marcus* (Aurelius) and (Aurelius) *Verus*.’

Second, IMPM, for IMPERATORUM, ET, VERI, that is to say, ‘Of the (two) Emperors and of *Verus*,’—viz. *Julius Verus* their friend and Legate;

River Jordan,’ &c. (note at p. 140) says of a village called *Abelin*, situate to the East of the great plain of Acre,—“Can this village take its name from the district of *Abilene*, mentioned in the 3rd Chap. of St. Luke, and of which *Lysanias* was the Tetrarch? It is generally supposed that the district was in another direction.”

Or, *third*, the middle part of that line may have been cut thus, *ARELVERI*, which would signify *AVRELII VERI*; some parts of the first monogram having perished off the rock, might leave it like a plain *M* to one who did not examine it very minutely: so the tail of the *L*, and the left part of *VE* may have decayed, and time have left them more resembling a *T* and an *E*, to the hasty observer.

The letters *MVO*, I apprehend, signify *Merito VOtam*. And the word *LVSIVS* is probably an accidental mistake of the person who cut it in the rock, having spelt it with an *S* instead of a *C*.

At the beginning of the fourth line *7* is only an imperfect *T*, *T* for *Tribunus*.—*FF*, *Flavia Firma*, the title which the 16th Legion bore according to several inscriptions.* The last two letters *VS*, doubtless mean, *Vivens Solvit*.

My translation of No. 2 will then be as follows:—

“For the safety of the Emperor *Aurelius Verus* [or of the Emperors *Marcus Aurelius* and *Aurelius Verus*; or of the (two) Emperors and of *Verus*.] *Lucius Maximus*, Tribune of the 16th Legion called *Flavia Firma*, who presided over the work, living performed this vow for him [or them] deservedly.”

I think there can be little doubt but the *Lucius Maximus* mentioned in this inscription, No. 2, is the same person as that named *Λ. Αὐρήλιος Μάξιμος*, *L. Aurelius Maximus* in two Greek inscriptions published in Burckhardt's *Syria* (p. 118), and who is there likewise styled *Π. ΑΕΓ. ΙΣ. Φλ. ΦΙ*, Tribune (*Χαλίαςχος*) of the 16th Legion *Flavia Firma*. Moreover, those inscriptions evidently relate to the same two Emperors (p. 117), though their names are not set forth; they are called the “Lords Emperors” (*κυρίων αὐτοκρατόρων*), and the inscriptions are of the like form with No. 2, for they begin *ὑπὲρ σωτηρίας*, *Pro salute*.

The small tablet, No. 3, is deeply cut into the rock, and contains some very indistinct letters, which Mr. Lempriere could not decipher.

The exact place where these inscriptions were discovered, is roughly represented in the sketch before given: it is at a turn of the road from Baalbec leading to Damascus through the valley, or Wadi, Barada, and distant about two miles to the N.W. of the village of Suk. The gorge, along which the modern road proceeds, is narrow; and below it, the river Barada pours its rapid and turbid waters down its deep bed. The hills on its banks are lofty, bare, and craggy. And Mr. Lempriere says, in his *Journal*, the “small river ran through the sinuosities of these hills, brightly contrasting its green borders with the barrenness of every thing

* Vide Gruter, ‘*Inscriptiones Antiquae*,’ p. 427, No. 12. Edit. Grævii, Amst., 1767, and ‘*Burckhardt's Syria*,’ p. 118.

around." The tablet No. 1, is at least one hundred feet above the road, and this traveller had to climb up the side of the sandstone rock, in order to read the inscriptions. The line of the ancient road, which had been *cut*, as the first inscription states, *through the hill*, is still visible at a point above the present road.

Some years ago, a previous traveller, the late Dr. E. Hogg, in his 'Visit to Alexandria, Damascus, and Jerusalem,' (Lond. 1835) p. 299 and p. 300, vol. i., noticed at the village of Zook (*Suk*),* the remains of former edifices; and near these, likewise, "fragments of large and small columns." He says (p. 301)—"in the Augustan tables, the situation of *Abila* is laid down at eighteen miles from Damascus, and thirty-two † from Heliopolis (*Balbec*)—a distance which approaches sufficiently near the actual position of Zook to warrant the conclusion, that this may be the site of the ancient town."—Again, he adds in a note, "Ptolemy gives to the town, between Heliopolis and Damascus, the name of *Abila Lysaniæ*, which corresponds with the narrative of St. Luke, who dates the commencement of the preaching of John the Baptist, 'when *Lysanias* was tetrarch of *Abilene*.' I have since heard, with much satisfaction, that Mr. *Bankes*, in previously exploring this district, discovered *inscriptions* which *establish* the *identity* of this ancient site."

Burckhardt (*Syria*, p. 2) mentions the same village, which he writes *Souk*, and likewise some chambers cut in the rock near it; but he did not notice any Latin inscriptions. Compare also Messrs. Robinson and Eli Smith's accounts as given in their 'Biblical Researches,' vol. iii. Appendix, p. 146, and note 1.

In all probability the inscriptions here said to have been found by Mr. *Bankes* near Suk, are the *same* as those, Nos. 1 and 2, now examined; but which have, as far as I can learn, never been made known or published. The name of *Abilene*, or rather of the *inhabitants* of *Abilene*, in No. 1, proves that the place itself, where the road was repaired by Julius Verus, must have been in the *territory* called *Abilene*, the chief city of which was *Abila*.

The learned Reland, 'Palæstina' (*Traject. Bat.* 1714), p. 527, having mentioned other Abilas, thus describes "*Abila ad Libanum*," which, from the following extracts, will appear to agree very well with the district near Suk:—"Fuit itaque *Abila*

* *Suk*, in Arabic, is a *Mari*, or a village having a periodical market.

† *Thirty-eight*, according to the 'Itinerary of Antoninus.'—These are the numbers and order of Roman miles taken from that work, (p. 198, 'Antonini Augusti Itinerarium.' Edit. P. Wesseling. Amst. 1735):—

'Heliopoli	.	.	.	.	.	M. P. XXXII.
<i>Abila</i>	.	.	.	.	.	M. P. XXXVIII.
Damascus	.	.	.	.	.	M. P. XVIII.

quædam in *Libano*, vel ad *Libanum*, sita, quæ vel hoc solo satis diversa esse ab *Abila* Perææ et Batanææ intelligitur, quod neutra possit dici sita fuisse ad *Libanum*, sed longè indè remota Austrum versus."

He adds (p. 528), "in Tabulâ quòque Itinerariâ veteri, quæ vulgò *Peutingeriana** audit, inter Damascus et Heliopolin *Abila* interponitur. Nec est hæc diversa ab Ἀβίλα quæ à Ptolemæo in Cœlesyria† locatur, septentrionalior Damasco, et ab eodem Ἀβίλα Λυσανίου, *Abila Lysaniæ* dicitur, unde Luc. III. 1, Lysanias Ἀβιληνῆς tetrarcha appellatur. Suidas hanc *Abilam* Phœnices appellat, Ἀβίλα, πόλις Φοινίκης ἐξ ἧς ἦν Διγενῆς, ὁ διασημώτατος σοφιστής. Τὸ ἑθνικὸν Ἀβιληνός.—*Abila*, urbs Phœnices, undè erat Diogenes celeberrimus sophista. Nomen gentile indè ductum est *Abilenus*." Habet hæc ex Stephano."

This is doubtless the same place as that which Josephus means by "the *Abila* of *Lysanias* as lying in, or near, *Mount Lebanon*," — Ἀβίλαν δὲ τὴν Λυσανίου, καὶ ὅποσα ἐν τῷ Λιβάνῳ ὄρει.‡

In October, 1836, the German traveller Russegger passing the same way as Mr. Lempriere did, thus describes these spots, but without any mention of the inscriptions: "under which the space of the ravine confined to a few fathoms, divides the river and the road. In a remarkable manner the art of man has also selected for his abode this place so celebrated by nature; in this respect, that in the steep declivities of the pass, but particularly in the northern wall; that is, on the left bank of the Barada, a number of catacombs has been excavated, and thereby has transformed this spot into the Necropolis, perhaps of some important, and nearly adjoining city—probably of *Abila*." § Again, "we passed several beautifully situated villages; we quitted on our left hand the place

* The order of the cities and miles from that map is as follows:—

Ἐλιόπολι	.	.	.	.	.	XXXII.
Ἀβίλα	.	.	.	.	.	XVIII.
Δαμασκό.						

This last word is abbreviated for *Damaspoli*, or the *p* may be an error for a *k*.—Vide 'Segm. ix. F. Tab. Itin. Peuting.' Edit. C. Maanert. Lips., 1824.

† Ptolemy, in lib. 5, *Geograph.*, under the head of 'The Cities of Cœlesyria,'—Κοιλῆς Σορίας πόλεις—places '*Abila* called of *Lysanias*.'—Ἀβίλα ἐκκαλουμένη Λυσανίου—after Ἡλιοβόλις.—See p. 369, Fasc. V. Edit. Wilberg. Essendix, 1844.

‡ Vide 'Flavii Josephi Opera,' tom. ii., p. 1048; *Antiq. Jud.*, cap. 5, lib. 19. Edit. F. Oberthur. Lips. 1783.

§ "Den mitunter auf wenige Klafter verengten raum der schlucht theilen fluss und strasse. Merkwürdiger weise hat die kunst diesen von der Natur hoch gefeierten platz ebenfalls zu ihrem wohnsitze gewählt, indem man in den felswänden des passes, vorzüglich aber in der nördlichen wand, das ist die am linken ufer des Barrada, eine menge von katakomben anbrachte, und diese stelle dadurch zur Nekropolis irgend einer bedeutenden und in der nähe gelegenen stadt, vielleicht von *Abila*, umwandelte." — 'Reisen in Europa, Asien, und Afrika,' von Joseph Russegger (vierte Abtheilung), p. 722. Stuttgart, 1842.

where once *Abila*, the principal city of *Abilene*, stood; and on our right hand upon a mountain the tomb of *Abel* is to be found. There also are said to be the ruins of an *ancient temple*." *

This mountain is *Gebel Abel*, and was so named from being situate, according to tradition, near the scene of the murder of *Abel*; and from which word,—the "Αβελ of the Septuagint,—the appellation of *Abilene* doubtless originated.

Pococke, a century before, pursuing the same route as the last two travellers, has given a good account of this *mountain* and the *temple*: it is in these words:—"Twelve miles from Damascus we saw to the right a mountain, which is very high and steep; there is a ruined church on the top of it; the place is called *Nebi Abel* (Prophet *Abel*); here, they say, *Cain* buried *Abel*." † A view of the church is engraved in his 'Description of the East,' plate 22, fig. A, from which it appears to have been a small temple with two Doric pillars in front, and which Pococke says was of great antiquity. He adds,—what is still more interesting to the present subject—viz., that "a Greek inscription which he saw on a stone about four feet wide and three deep, was fixed in the *inside of the church*;" and that "it made mention of *Lysanias, tetrarch of Abilene*." ‡

The inscription itself, which is unfortunately imperfect, was published in a later work by the same author;§ it relates that "Nymphæus Ae., a freedman of *Lysanias the Tetrarch*, having made the road, erected the *Temple*."—(Νύμφαιος Αε. ΑΥΣΑΝΙΟΥ ΤΕΤΡΑΡΧΟΥ ἀπελευθέρωσεν τὴν ὁδὸν κτίσας. τὸν ναὸν οἶκος.)

And Pococke correctly considered "this inscription as a confirmation that *Abila* was near," though others might hastily have concluded that *the spot itself* pointed out the ancient site of *that city*, which it could not have been, because of its *too near* proximity to Damascus,—a place still fixed, and distant *eighteen* Roman miles from *Abila* according to Antoninus. No reasonable doubt, however, can, I think, be advanced against the ruins of the temple on the summit of *Gebel Abel*, having been situated *within* the territory belonging to the *Tetrarch Lysanias*, and consequently *in part of Abilene*.

Very recently Captain Lynch, reversing the way which the previous travellers took, passed up the Wadi Barada from Da-

* "Wir passirten mehrere schön gelegene dörfer, liessen links die stelle, wo einst *Abila*, die hauptstadt von *Abilene*, stand und rechts auf einem Berge *Abels* grab sich befindet. Dasselbat sollen auch trümmer eines alten Tempels seyn."—*Ibid.*, p. 723.

† 'Description of the East,' vol. ii., p. 115. Lond., 1745.

‡ *Ibid.*, p. 116.

§ 'Inscriptiones Antiquæ, Græc. et Lat., à Richardo Pococke, cap. i., No. 2, p. 11752.

masceus to Baalbec, without noticing *these* Latin inscriptions. But he narrates (p. 494), "High up on the eastern bank" (of the *Barada*), "over the bridge"—(I conclude the same that Burckhardt calls "Gissr el Souk," or the *Bridge of Souk*)—"are tombs excavated in the rock, and the ruins of a Roman aqueduct, and a tablet over it with an *inscription* in *Roman* characters."

From the evidence here collected, it will appear most likely that the *Abila* of *Lysanias*, the chief town of the *Abilene* district, is correctly placed close to the present village of *Suk*, in about lat. 33° 40' N., and E. long. 36° 9', on the bank of the river *Barada*, formerly the *Chrysorrhoas*,* or "Golden Stream," a little to the E. of that range of Mount Lebanon, generally termed *Antilibanus*, and now *Gebel e' Sharky*, which in Arabic signifies "the *Eastern Mountain*," and in the N. of Syria, formerly named *Cœlesyria*.

The date of the inscription No. 1, I apprehend, was about A.D. 164, for both the emperors bear the title of *Armeniacus*, that was assigned to them for the victory obtained by the Roman arms over the Parthians in Armenia, the war with which commenced A.D. 162. No. 2 has been erected shortly afterwards: it does not bear in any particular way on the topography of *Abilene*, except in setting forth that "Lucius Maximus OPERI-INSTITIT," "presided over the *work*,"—by which must be intended, the *cutting through* of the hill, and the *restoring* of the road.

In connexion with one of the same emperors I may here briefly notice another tablet exactly of the like form as No. 1, which at this day is also to be seen in Syria, in a similar position, on the bare face of the rock at the mouth of the *Dog* river, *Nahr el Kelb*, the former (*Wolf* river) *Λύκος*,† or *Lycus*, on the coast about 6 miles to the N.E. of Beirut (*Βερυτός*, *Berytus*), because certain remarks on the Latin inscription there remaining have been made by Burckhardt under a mistake.

Mr. Joseph Bonomi several years afterwards published a short paper on this and other "remains of antiquity in the vicinity of Beirut," at p. 105, vol. iii. 'Transactions of the Royal Society of Literature,'‡ with two lithographed plates. This traveller's copy

* See 'Pliny Nat. Hist.,' lib. v., cap. 18; it is the *Χρυσόρροος* of Strabo, lib. xvi. Dr. Adam (with Pococke and some other geographers) considers it the *Abana* of Scripture, and the 'Aḥarâ of the Septuagint. (See 2 Kings, v. 12.) It is now called the *Barada*, which, or *Barda*, is the name of the river *Abana*, as appears in the Latin interpretation of the Arabic version, at p. 539, tom. ii. of the 'Biblia Sacra Polyglotta,' by B. Walton, (Lond. 1657).

† Strabo ('Geograph.,' lib. 16) writes it, *δ Λύκος ποταμός*.

‡ In that Vol., note 2, at p. 105, regards one of the Assyrian tablets, and should be referred to after the word "preserved" in the text, two lines above. Mr. Bonomi has written to me in correction thus:—"I do not know by what accident it is said, that a cast of the tablet containing a Latin inscription was made by me, and presented to the

of the inscription contained in the tablet represented at No. 4, Plate II., differs from that given in Burckhardt's 'Syria,' p. 190, in the words LYCO and DILATVIT, for LICO and DELATAVIT. Burckhardt seems not to have observed the upper portion of the Y in the first of these words as it projects above the sixth line of that inscription, and I think that either an A has decayed from between the T and V in the second word, or the V has been monogramatically written *AV* for AV. This inscription, in its purport, is likewise similar to that of No. 1, for it records that the "Emperor *M. Aurelius Antoninus* widened his own 'Antoninian Way' in consequence of the mountains hanging over it having been worn away by the river *Lycus*,"—MONTIBVS INMINENTIBVS LYCO FLV-MINI CAESIS VIAM DILATAVIT ANTONINIANAM SVAM—and that this was done PER....."by" some one, whose name, as Burckhardt says, has been "purposely erased;"* it may very possibly have been by the same '*Julius Verus*, the legate of the province of Syria,' who, as the inscription No. 1 makes known, caused that road, which had been broken away by the river (*Chrysorrhoas*), in the *Abilene* territory, to be restored.

But, as to the *identity* of the *Emperor* here named, Burckhardt has erroneously observed, that "according to the opinion of M. Guys, the French consul at Tripoli, which seems well founded, the Emperor mentioned in the above inscription is not Antoninus Pius, but Caracalla, as the epithet *Britannus* cannot be applied to the former, but very well to the latter."† The Emperor, however, who is distinctly called M·AVRELIVS·ANTONINVS· is neither Antoninus Pius nor Caracalla—but that emperor (the adopted son of the former) usually named *Marcus Aurelius*, so well known to all the visitors of the *Campidoglio* at Rome for his equestrian statue still in excellent preservation.

This last inscription has, I conceive, been erected between the years of our Lord 175 and 177, and *after* the death of his colleague, which occurred in A.D. 169, for L. Aurelius Verus is *not* named in it, as he is in the former, No. 1; and, moreover, the title of GERMANICUS would prove that it was *subsequent* to the war against the Marcomanni; hence most probably it was made *after*

British Museum: the only cast I made was that of the *Assyrian* figure now in the British Museum." I may observe that this figure, drawn on the right-hand of No. 3, plate 2, very closely resembles the bas reliefs lately brought from Nineveh by Mr. Layard, and especially that of the *King* from the N.W. palace at Nimroud. Full half of the tablet from Nahr el Kelb is covered with the *same cuneiform* characters as those from Nineveh, and they are divided, like them, by horizontal and parallel lines. Can this have been intended for the representation of the king *Nebuchadnezzar*? A staff, or rod, carried in one hand appears generally as an attribute of royalty in these figures of *Assyrian Kings*. Compare the expressions in Isaiah x., 5 and 24.

* Maundrell (p. 37) uses these two words in reference to the same line.

† Syria, p. 190.

the death of *Avidius Cassius* in A.D. 175, when the surviving emperor visited Syria.

Postscript.—After this paper was read, the Rev. G. C. Renouard informed me, that Maundrell had also published the last inscription. I have since referred to it in his 'Journey,' and found that his copy differs from the two already commented upon in the words PARTH, for PART; in MAX being omitted after BRIT; and in IMMINENTIBVS and DILATAVIT. That early traveller says of the "*Antonine way*," as he styles it, "you have a path of above two yards' breadth cut along" the mountain's "side, at a great height above the water, being the work of the Emperor *Antoninus*." * This would lead the reader incorrectly to conclude that *Antoninus Pius* was the emperor so commemorated.

The several inaccuracies in the transcripts of the inscriptions here mentioned, although made by authors who were scholars, and above the ordinary intelligence of travellers, well illustrate the necessity and importance of copying with *minute exactness* all ancient inscriptions. *Epigraphology* is always difficult, and often abstruse; and it ought not to be rendered more so by negligence and want of care in the copyist.

Upon the utility of antique inscriptions in determining questions of great interest in topography and comparative geography, I need not dilate; and indeed the examples briefly given in this paper tend to demonstrate their value without any further observations. So Colonel Leake, who is one of our ablest epigraphologists, correctly terms "ancient inscriptions—those most faithful of all geographical evidences;" † particularly, as I may add, when they occur *in situ*, and could not have been transported to the places where they are found. But I may, without presumption, be allowed to remind every traveller what our late President, Mr. W. J. Hamilton, in his able article on Geography, published in the 'Admiralty Manual of Scientific Inquiry,' states (at p. 154), in these words:—"Above all things, let him diligently search for *inscriptions*, and then *carefully copy* ‡ all that he may find, endeavouring as much as possible to preserve the precise form of the characters in which they are written." And I may likewise repeat the following remarks, which I made many years ago in another work: § "That unless an inscription be copied as it is actually

* See 'Journey from Aleppò to Jerusalem,' by H. Maundrell. (Edit. 6. Oxon., 1740), p. 36.

† P. iv., Pref. to 'Borchardt's Syria.'

‡ Mr. Renouard well observes, an "accurate impression made with *softened paper* is greatly preferable to any copy."

§ 'Trans. of the Royal Society of Literature,' vol. iii., p. 261, note 37.

seen to exist upon the original monument, it becomes comparatively of little value to the epigraphologist. A true copy of an inscription ought, in fact, to be an exact drawing; every line correctly placed, every letter according to its relative position and size, every broken portion and every mutilated letter accurately and proportionably given."

Supplemental Note.—In the latter part of January last the Rev. G. C. Renouard referred, with respect to the preceding paper, to 'Orellii Inscript. II. p. 428, No. 4997 and No. 4998;' this was then kindly communicated to me, but owing to my immediate departure from London I had no opportunity of seeing Orellius's work until my return in June, when indeed my paper was in type. To my surprise I then found that Professor Orellius had, as long ago as 1828, published both the inscriptions Nos. 1 and 2; but that they were merely copied* from Letronne's memoir (of which I was also previously ignorant) in the 'Journal des Savans,' Mars, 1827. Having just been able to consult that volume, I will here give M. Letronne's short account of them.

This last author has there described and commented on some ancient inscriptions collected by the Count de Vidua in a journey through Turkey; and he says (Journal for 1827, p. 167) of my inscription No. 1 (Orellius, No. 4997):—"Dans la vallée arrosée par l'ancien Chrysorrhœas, aujourd'hui *Bawadi*" (incorrect for *Barada*), "à l'endroit où les montagnes se resserrent et laissent entre elles à peine un étroit passage, on remarque que la route a été élargie de main d'homme dans un espace de plus de deux cents pas. L'époque et le but de ce travail prodigieux sont indiqués dans cette curieuse inscription Latine gravée sur le roc même, et répétée à chacun des deux points extrêmes de la partie de la route qui a été élargie."

The inscription is written in *nine*, instead of *six*, lines; it only differs from my copy in having an L. between CAES. and AVREL. in my *second* line; in the presence of an R after P at the end of my *fourth* line, showing that PR. PR. is, according to my reading, the plural of *Propratoribus*; and in having a V between the third and fourth letters of my *fifth* line, which also confirms my suggestion of the word, PRO^VINCIE.

Letronne continues:—"D'après les mots IMPENDIIS ABILENORVM, on voit que ce lieu étoit dans le territoire des *Abiléniens*;

* In his copy, No. 4998, however, of the Inscription No. 2, Orellius has erroneously omitted XVI. after LEG. in the fifth line.

ce qui ne permet pas de douter que les vestiges d'antiquité qu'on trouve non loin de là n'appartiennent à la ville d'*Abila*, dite *Abila Lysaniæ*, et dont l'emplacement convient aux distances marquées dans la table de Peutinger. A côté de cette inscription, une autre a été gravée, indiquant le nom du tribun *Volusius Maximus*, qui a surveillé l'ouvrage."

Since this inscription demonstrates that my copy No. 2 is very imperfect (as I had supposed), I here insert it at length (No. II.)

PROSALVTE
IMPAVGANTONI
NIETVERIIMVO
LVSIVSMAXIMVS
7LEGXVIFF
QVIOPERIIN
STITIT—VS.

In the *third* line the occurrence of IMVO suggests to me that these letters most probably signify Isidi Magnæ VOtam. Burckhardt, as I have already stated at p. 40, mentions *Lucius* (Aurelius) *Maximus*; who, according to the inscription which he has preserved at p. 118, 'Syria,' τῇ ἐκτὶ ἀνεθήκεν—placed the figure (or bust) of *Isis* (EICIN for IZIN) on "the niche to the right of the great door" in the temple at Missemā, formerly *Pharna*, situated to the S.E. of Damascus, in the Ledja, or *Trachonitis*. Hence, I conceive, this corroborates my previous opinion that this is the *same* individual who is recorded in Burckhardt's inscription as being *Chiliarch*, or "Tribune, of the 16th Legion *Flavia Firma*," and not another person named "*Volusius Maximus*," as Letronne has considered. Consequently, the correct translation of No. II. I take to be this:—"For the safety of the august Emperors *Antoninus* and *Verus*, *Lucius Maximus*, Tribune of the 16th Legion, called *Flavia Firma*, who presided over the work, living performed this vow to the Great *Isis* for them."

This more perfect copy (No. II.) of the inscription No. 2, as made by the Count de Vidua, proves in a most unexpected and gratifying manner to me that my *first* interpretation of it, as proposed at p. 39, is the *true* one; and it also affords another remarkable instance of the mistakes made unawares by intelligent persons in too hastily transcribing inscriptions.

JOHN HOGG.

III.—*A fourth Excursion to the Passes into Thibet by the Donkiah Lah.* By Dr. J. D. HOOKER, F.R.S. Communicated by Sir W. J. Hooker, F.R.S., F.R.G.S.

[Read December 10th, 1849.]

[THE following account was extracted by Mr. J. Hogg, the *Hon. Secretary*, from a letter by Dr. Hooker to his father, Sir William J. Hooker, bearing date "Lachoong River, Thibet Frontier, September 13, 1849," and only received on November 26th last, in which he described another excursion to the Passes of Thibet, by the *Donkiah Lah*, in the East Himalayan Chain. But Sir William Hooker informed Mr. Hogg that his son "does not appear to have been *actually upon* the Great Plateau of Thibet, except on *one* of these occasions." The map, by M. Petermann, which accompanies this paper, is executed partly from rough drawings made by Dr. Hooker, partly from trigonometrical and other observations by Lieut.-Col. Waugh and Dr. Campbell.]

THIS pass, before unknown to European travellers, is nearly in lat. 28° N., and somewhat to the E. of $88^{\circ} 30'$ E. long., at an elevation of 18,000 feet. It differs from the Nepal passes in being a very narrow, wall-like ridge between the mountains called *Donkiah Lah* (23,175 feet), on the E., and Kanchan-jhow (22,000 feet) on the W. There extend on the N. and S. sides of the pass, lofty plains (17,000 feet), out of which these grand mountains rise. On one side the Lachoong river issues from lakes at the base of Donkiah; and from the other, or Thibet side, the river Lachen takes its rise from other lakes on the elevated plains of Cholamo. The Lachoong proceeds S. to Choongtan; the Lachen to the N.W., near Kongra-Lama (15,500 feet), afterwards turning S. enters Sikkim between Kanchan-jhow (16,000 feet) and Chomiomo (19,000 feet?), and continuing southwards to Choongtan, it unites with the Lachoong. From the summit of the Donkiah Pass, Dr. Hooker says, he "had a most splendid view for 60 miles N. into Thibet. First came extensive plains, dunes, and low, rocky eminences, utterly barren, and red from the quantity of quartz, tinged with oxide of iron, which form the hills N. of Kongra Lama; beyond them again, and as far as the eye could see, were ranges of rocky mountains sprinkled with snow, and of comparatively moderate elevation." From above Kongra Lama, at 16,000 feet, the prospect became wretched; and thence the most bare and desolate scenes prevailed. The rocks, disposed in horizontal strata, crop out on the mountain faces and are broken into low crags along their summits. One range succeeded another in sameness, until in the extreme dis-

tance the horizon was bounded by another chain higher than the rest, rugged, black, and deeply covered with snow.

The entire landscape sloped N.W., and the ranges lie E. and W., so that Dr. Hooker could not doubt the correctness of the statement of the people that "all the waters from the N. of his position and W. of the Paniomchoo are feeders of the Arun, which enters Nepal far to the W. of Kinchin-junga." The watershed of the Yarrow (*Tsampo*), he thinks, is the lofty range which he saw in the distance. The natives do not distinguish these ranges because of their great uniformity; and the few roads wind amongst and over them in such a tortuous manner, that all the way between the Himalaya and the Yarrow the traveller beholds neither the one nor the other of these grand geographical features, until each becomes the terminus of his day's march.

Flat-bedded valleys and rocky mountain chains of moderate heights constitute the daily marches from Darjeeling (7165 feet, in 27° N. lat. and $88^{\circ} 28'$ E. long.) to Digarchi.

The dimensions of the Cholamo plains and lakes are much exaggerated; the latter being actually less in size and fewer than those of Lachoong, and the plains less extensive than Dr. Hooker expected. He, however, did not descend to the plain, for it is continuous with Kongra Lama, which he measured, and he could not mistake the *average* level from the top of the pass to be other than identical with that of the like plain on the south face, namely, about 17,000 feet.

The line of perpetual snow is about 17,000 feet on the S. slope of the barrier range, and above 18,000 feet on the N. or Thibetan side. The writer considers it to be not more than 14,700 feet on the S. face of Kinchin-junga, that lies much to the S. of this place; and at Tunkra (which is at about the middle parallel of the snows) it is likewise about 14,700 feet.*

The height of the Thibetan plateau is 16,000 feet at Kongra Lama, and 17,000 at Cholamo; but the latter being close to the mountains, 16,000 feet may therefore, perhaps, be the average; whence the slope is not continuous to the Yarrow, but broken up by so many chains and valleys, that no safe results can be deduced without an examination of the whole distance. This at present cannot be effected; even these *cis-Thibetan* expeditions are difficult. Where Dr. Hooker was then located (about 2000 feet higher than the summit of Mont Blanc) he had many miles to send for supplies of *Rhododendron* branches for firing; and headache and sickness constantly harassed him.

* In a later letter, dated *Darjeeling*, January 3, 1850, Dr. Hooker writes—"Humboldt's 'Aspects of Nature' has just arrived here. What he quotes from my communication to him, respecting the *Snowline* here, is perfectly correct, viz. 15,000 feet for the southernmost ridge of the belt in Sikhim, and 20,000 feet for the Thibetan elevation of the belt."—H. S.

The flora is remarkable, but less rich than that of Kongra Lama and the plains of Thibet. The mountain scenery is grand beyond all description—so magnificent an amphitheatre of rocks and snow occurs at the base of Kanchan-jhow that no one can properly describe it.

"On two sides" (Dr. Hooker writes) "scarped cliffs of gneiss with sunken veins rise abruptly, capped with snow, which streams in glaciers down every gully. In front the wall of Kanchan-jhow rises as a glacier 4000 feet nearly perpendicular, to all appearance a great blue curtain, reaching from earth to heaven, except where a small black rock appears, and then icicles 50 feet long run in lines like organ-pipes; the lower part of the valley on the fourth side of the area is shut off by a sharp ridge of debris swept down from the glaciers above, 500 feet high; and all within is a maze of cones of snow, laden with masses of rock rising 50 or 60 feet from the snow."

He continues, "This valley is about 2 miles broad each way, and I can compare it to nothing but the crater of a stupendous volcano, whose little enclosed cones of fire have been suddenly turned into ice. To-day I went up the flanks of Donkiah to 18,000 feet, amongst the knot of snowy peaks W. of Chumaliri (23,929 feet), and such gulfs, craters, plains, and mountains of snow are surely nowhere else to be found, except in the polar circles. Of course, I have seen nothing to compare for mass and continuity of ice with *Victoria Land*; but the mountains, especially Kanchan-jhow, are, beyond all description, beautiful; from whichever side you view this latter mountain, it presents a fortress of pure blue glacier-ice, 4000 feet high, and 6 or 8 miles long."

Dr. Hooker, at the altitude of 17,000 feet, "was trying to make a panorama of the frontier mountains, especially of Kanchan-jhow and Donkiah, which rose in all their grandeur on either side, with the broad plains and blue lakes of Lachoong at his feet, and the rugged crested rocks and intermediate peaked mountains of the pass in front—all backed by the blue sky of Thibet;" but suddenly a snow storm coming on, prevented his completing his drawing.

Dr. Hooker met with many interesting lichens at the summit of the Donkiah Pass, and in particular *Lecanora miniata*;^{*} this species, which he calls his "most antarctic plant," having found it on the rocks of Cockburn Island in 64° S. lat., he observed on stony hills at 19,000 feet, and of the same bright orange-red colour, rendering it visible afar off, as in the former locality.

Here, at 16,000 feet, the adventurous traveller visited a considerable *hot spring*, having a temperature of 112° Fahr., and

^{*} This plant is beautifully drawn and coloured at No. 2, plate 198, of Dr. Hooker's 'Botany of the Antarctic Voyage.' In geographical range it extends to both extremities of the globe, for it also occurs in the Alpine regions of Sweden.—H. S.

containing sulphurous hydrogen gas ; it is remarkable as “issuing from the broad mossy floor of a valley, close to a bed of *perpetual snow*.”

Additional Note.—In a subsequent letter from Dr. Hooker, dated *Darjeeling*, January 3, 1850, he observes :—“These mountains (the Himalaya) can in the meridian of Sikhim be only defined by the bed of the Yarrow (*Tsampo*) (say 14,000 feet) on the N., and the plains of India (3000 feet) on the S. All between is Himalayan mountains. We naturally call the heavily snowed mass the *ridge*, or *axis* of the chain—for that is the visible prominent feature from the S. But it does not follow that the snowy portion indicates the *true axis*, although a few isolated peaks may rise therefrom and top the world ; for the snow, being deposited by a southerly wind, only falls on the southernmost elevations, and is prevented from reaching the true axis behind. Were the snow deposited equally on all the Himalaya, we should have the whole land between the parallel of Kinchin-junga and the Yarrow covered with perpetual snow, and then the axis of the chain would clearly show itself far behind Kinchin-junga, and the latter mountain would appear rising from a spur of the same. The snow-line being 5000 feet higher on the Thibetan portion of the range than on the Sikhim, cannot but deceive any one as to the *true* position of the centre of the chain, *i. e.* its *axis*.”

I have always said that the Sikhim Himalaya (I mean the *snowed* mountains) do not form a continuous snowed chain running E. and W., but that they are meridional ridges, running N. and S., separated by waters that flow southerly between them. I have also insisted that the mean elevation of the ranges between the courses of the Arun and Yarrow is much greater than that between the Arun and the plains of India, though so little snowed.

And Sir William J. Hooker has recently (April 27th) communicated, that Dr. Hooker in his last letter, just then received, says :—“I no longer consider the Himalaya as a *continuous snowy chain* of mountains, but as the *snowed spurs* of far *higher unsnowed land behind* ; which higher land is protected from the snow by the peaks on the spurs that run S. from it. Dr. Thomson” (brother of the distinguished chemical professor of Glasgow) “has, independently of me, come to the same conclusion.”

IV.—*Memoir on Madagascar.* By J. A. LLOYD, Esq., F.R.S. F.R.G.S., &c., Surveyor-General of the Mauritius, late Lieut.-Col. of Colombian Engineers. Communicated by Earl Grey.

[Read December 10, 1849.]

THE island of Madagascar was discovered and visited by Europeans only in 1506, and shortly after by Tristan d'Acunha: it was called by the Portuguese 'St. Laurence'—either after its discoverer, Laurence Almeida, or perhaps in honour of a patron saint. By the French, in the reign of Henry IV., it was designated 'La Dauphine.' The Moors and Arabs, who had known it for ages before, gave it the name of 'Serandah;' and Marco Polo describes it, at the end of the 13th century, as 'Majaster.' Ellis says the natives on the coast do not give it the name of Madagascar, but generally *Nosindambo*—'island of wild hogs.' There are other figurative expressions for the island, as *Ambonytany*, *Ambany-lanitra*—'upon the earth and beneath the skies;' or *Ny Anivony*, *Ny Riaka*—signifying 'The, in the midst of the flood.'

Madagascar is separated from Africa by the Mozambique Channel: its distance from the Cape of Good Hope is 1800 miles, and from Mauritius 480 miles. Its greatest length from N. to S. is 900 miles; and breadth, from E. to W., 350; and the average contents of this vast island cannot be estimated at much under 200,000 square miles.

Situated S. of the equator, and extending from latitude $11^{\circ} 57'$ to $25^{\circ} 42'$, it will readily be conceived that the aspect, as well as the climate of this great territory, must offer much variety.

The whole island 'flows with milk and honey,' and abounds in mineral riches of every description, as well as rice, silk, cotton, spices, and magnificent timber. The interior is considerably elevated, and the slope down to the sea undulates into beautiful vales full of rivulets and rivers; and the soil, in general consisting of decomposed granite, is of delightful fertility.

Many of the streams are navigable into the interior; but their entrances are, particularly on the E. side, almost invariably blocked up with sand-banks, caused by the roll of the ocean from E. to W. on one side of the island, and the incessant currents which set in from the Mozambique Channel, on the other.

These sand-banks, or bars, by opposing the outflow of the rivers, have caused vast marshes to accumulate along the sea-coast; and the decomposition of vegetable matter thus kept in stagnancy engenders pestilential miasmata, which, encircling as they do a large proportion of the island during one-half of the year, produce the dreaded Madagascar fever, the fatal effects of which

have given this country, like many others, the melancholy designation of *the European's grave*.

The high land of the interior, on the contrary, is considered very healthy; and its inhabitants, when they come down to the coast, are not less subject to the disease than Europeans; and they often carry back with them, on their return from the sea-ports, the elements of the fever, to which, in many instances, they fall victims, even in their own native climate.

There are two distinct seasons on the eastern coast; the first, called by the Europeans the *fine season*, begins in May and terminates towards the middle of October. The heat is moderate: strong breezes from the S. and S.E. blow during the day, and from the S. to the S.W. after sunset, which renew the air and dissipate the effluvia of the stagnant waters. The appearance of the country during this period of the year is delightful to an extreme, and the provinces of the interior especially are most healthy and salubrious.

The second, or bad season, begins towards the end of October, and continues until April. The hottest and most unhealthy weather happens in January, February, and March. Storms of thunder and floods of rain inundate the country during this period. The wind is calm, or blows lightly from the N.E. during the day, and from the N. to the N.W. during the night. It is in this season that the influence of the intense heat upon the animal and vegetable substances washed down by the floods breeds infectious and deadly vapours.

On the N.W. coast the N.E. trade-wind blows without intermission from October to April; during the remaining part of the year it varies from S. to W. from noon to night; it then shifts by S. to E., and remains in the latter quarter the next forenoon.

The temperature of the interior is much cooler than that of the sea shore: the thermometer in summer, that is to say, from October to May, rising to 85° Fahrenheit, and in winter falling as low as 40°.

The following are the provinces into which Madagascar is divided, according to the Hovas and natives generally:—

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|------------------|--------------------|
| 1. Vohimarina. | 11. Vangaidrano. |
| 2. Iboina. | 12. Anosy. |
| 3. Maroa. | 13. Androy. |
| 4. Ivongo. | 14. Mahafaly. |
| 5. Antsianaka. | 15. Fierenana. |
| 6. Ambongo. | 16. Tsienimbalala. |
| 7. Antankay. | 17. Ibara. |
| 8. Betsimsaraka. | 18. Menabé. |
| 9. Anteva. | 19. Betsileo. |
| 10. Matitana. | 20. Ankova. |

Independently of these primary divisions, there are numerous others of less importance, which will be noticed in some cases in the following general description of each province :—

1. Vohimarina, the most northern division, is bounded towards the S. by Iboina, Ivongo, and Maroa ; it is mountainous, thinly populated, and incapable of extensive cultivation. Iangogoro, one of the highest mountains of Madagascar, is situated in this province ; its summit commands an extensive prospect of the surrounding country. There are four principal ports in Vohimarina—Diego Suarez, Port Luquez, Andravena, and Vohemaro ; the latter one is said to be on the healthiest part of the coast, and is strongly recommended by travellers for establishing a settlement.

Diego Suarez, or British Sound, called by the natives Mahazeba, one of the finest harbours in the world, is about 170 leagues from the capital Tananarivo : besides being very healthy, it is advantageously situated at the conflux of several rivers, which afford excellent communication for trade with Antsianaka and Iboina, where cattle are plentiful.

The western part of this province is inhabited by the north Sakalaves, and the eastern coast by the Betsimsararakas.

2. Iboina is to the southward of Vohimarina, and is bounded on the eastward by Ivongo, and on the southward by Antsianaka. The country is level and woody, abounds in marshes, and is very subject to fever. The soil is generally productive, and cattle numerous in this province.

Passandava and Narenda bays are the principal anchorages : Mazangaye, the chief town, is at the extremity of the latter, and contains about 800 houses, of which 200 are in stone. The island of Nosi-bé, on the coast of this province, is likewise a frequent anchorage of the French, to whom it belongs.

Iboina carries on a considerable trade with the Arabs : it is inhabited by a tribe of Sakalaves, who are described as treacherous, cruel, sanguinary, and very numerous.

Although they have been subdued by the Hovas they are still well armed, and begin to breathe an independence, which their intercourse with the French at Nosi-bé has not a little contributed to inspire them with. They occasionally send armed expeditions against the Hovas to revenge the death of their chief, killed by order of the Queen. A French Commandant, on a late communication with them at Nosi-bé, attempted to check these depredatory excursions ; but his interference was resented by the Sakalaves, and it was some time before friendly intercourse was again renewed with the Europeans.

3. Maroa is likewise to the southward of Vohimarina, and is bounded on the western side by Ivongo. The general face of the

country abounds in hills and forests, and is considered fertile. Some of its vegetable productions are remarkably fine, particularly the Ankondro, or banana, which attains an extraordinary height; it furnishes also timber of most excellent quality.

This province is inhabited by a tribe of Betsimsarakas; the population is far greater than that of Vohimarina. Maroa readily submitted to Radama in 1823; but they nevertheless, at the present time, cause much trouble to the Hovas, by sending out plundering parties to steal their cattle. The best anchorage is in Antongil Bay, at a place called Nava, between Mary Island, or Marotte, and the main land.

4. Ivongo is bounded on the W. side by Iboina, Antsianaka, and Antankay; on the southward, by Betsimsaraka; and on the N.-eastward, by Maroa. In general appearance this province greatly resembles Maroa, being hilly, woody, and fertile. Cattle, and a considerable quantity of rice, were exported from here to Mauritius and Bourbon previous to the rupture with Madagascar.

The most important circumstance in connection with the history of this province, relates to a French settlement at the upper part of Antongil Bay, by Count Beniousky, in 1773, which, unfortunately for Madagascar, was cut short by the death of this enterprising nobleman and the machinations of his enemies.

The bay of Antongil contains large quantities of oysters and several anchorages—Menahar is one of the best; but the most common one is to the N. of Marotte, a musket shot distant, and is called by the natives Marounsitra. The river Tangbale bears N.N.W. from Marotte, and the anchorage at its mouth is called Port Choiseuil.

Near the village of Iba-Ratsi, in the interior of this province, there are some beautiful groups of crystals of quartz.

The island of St. Mary lies off Ivongo, at a short distance from the shore; the inhabitants call themselves 'Zafy Ibrahim,' and the island, 'Nosi Ibrahim' (children of Abraham and island of Abraham). St. Mary was ceded to the French by a regular treaty previous to the conquest of Madagascar by the Hovas, and occupies a considerable place in the history of French intercourse with the Malgaseys. It is represented as being exceedingly fertile but unhealthy. On its west side there is a bay with a small islet at its entrance, called Quails' Island, which affords shelter for small vessels.

Ivongo is inhabited by a Betsimsaraka tribe, subject to the Hovas, and treated with much severity by them.

The coast of this province abounds with whales, and during a certain period of the year Antongil Bay is a favourite resort for whalers of all nations. The inhabitants of Tintingue are remarkably expert in spearing the whales from their slight canoes.

5. Antsianaka is bounded on the N.W. side by Ambongo, on the eastward by Ivongo and Antankay, and on the southward by Ankova. This is an extensive province in the interior, abounding with large herds of cattle, but very subject to the fever. It also produces very fine cotton and silk. Antsianaka contains two large lakes, the Antsana, or Imanangora, near the frontier of Antankay, and the Nosi-Vola, containing an island on which the chief town of the district, called Rahidranou, is built. The town is surrounded by a triple row of palisades, and contains many houses. The inhabitants of this province form a distinct tribe designated as the Tsianaka; they are inconsiderable in numbers, and subject to the Hovas. In general, the Tsienakas are good workmen as jewellers, silversmiths, and embroiderers; those of the capital particularly excel in the manufacture of assegais, cutlasses, gun-locks, silver chains, cotton and silk tissues, and beautiful carpets.

6. Ambongo is N. of the Sakalava country, and is bounded on the S.E. side by Antsianaka. It is level, woody, and fertile, and abounds with immense droves of cattle, both tame and wild, more than any other province of Madagascar. Moroa-bé, the capital, is a large town of 300 houses, and surrounded by a deep trench. At one time it was considered the chief town of all the northern Sakalaves. The town of Boina is surrounded by palisades surmounted with spear-heads. The royal dwelling is a regular fortress; its palisades are double, and more than twenty feet high.

Mazunga, at the entrance of Bombetoe Bay, is the best anchorage.

The province of Ambongo is inhabited by a Sakalava tribe, and was invaded by Radama with a large army; no resistance was made to his forces, but every subterfuge and deception of which the Malgasey are capable were met with by the conqueror in bringing the Sakalava chief to terms of subjection. The inhabitants of Ambongo are in general less civilized than their neighbours of the south.

7. Antankay, called sometimes Ankay, lies to the eastward of Antsianaka and Ankova; it is bounded on the N.E. by Ivongo and Betsimsaraka, and on the southward by Anteva. This is a narrow strip in the interior of the country; the southern part consists principally of a level plain between lofty hills, watered by the river Mangoro. The inhabitants of this part are of the Bezonzano tribe, likewise called the Zaffimoran; they are exempt from military service, but are constantly obliged to carry baggage to and from the capital for the Hovas. They are sometimes confounded with the Betsimsaraka tribe of the northern part of the district, but they are quite distinct, and separated by a forest. The Bezonzons are a people of independent spirit, and were formerly amongst the most turbulent and anarchical in the island;

they are a large and robust race, of a copper colour; they have a large nose (not flat) and African lips, and their eyes have a wild but prepossessing expression which strikes every one. Their northern neighbours are of the Betsimsaraka tribe, and enjoy the same privileges as those of Betsimsaraka Proper; they are thin and delicate, and have straight and long hair like the Malays; their skin is swarthy, but of a light hue; their nose flat, and mouth large, with projecting upper lip. Their small and deep-set eyes give them a treacherous and ferocious look, which reflects their true disposition.

It is reported that this district contains large quantities of silver, but that the spot where it is found is kept secret from strangers and from the neighbouring provinces.

The road to the capital by Tamatave crosses Antankay, as well as two tracks leading to the northward. The former passes through the village of Mainouf, one of the most considerable in this province, containing 100 houses.

8. Betsimsaraka lies to the southward of Ivongo, to the northward of Anteva, and to the eastward of Antankay. The soil is fertile, and the country to some extent brought under cultivation. It is, however, stated by the natives that their plantations are frequently destroyed by the herds of wild pigs with which the neighbouring provinces are infested. The northern part of this district is celebrated for the growth of roots; Radama had once the full-sized figure of a man carved out of a single manioc root grown here. Rice also is cultivated to a great extent as well as other grain, and excellent oysters are found near the bay of Fenerif. In general, the land is flat towards the sea, and mountainous as it approaches the interior; in some places it is swampy, and covered with thickets and forests, but in others it offers abundance of grazing land, and is covered with numerous herds of cattle belonging to the queen, and a few also the property of the inhabitants. The pasturage of Ambanivoule is particularly celebrated.

The principal trading ports are Foule Pointe, Fenerif, and Tamatave. Fenerif is well situated for the purposes of traffic, having the advantage of water carriage for a considerable distance into the interior, by which means rice, yams, and other vegetables are conveyed to the coast with greater dispatch and facility, and at less expense than in most other ports; but the anchorage is exposed to violent currents and a heavy surf.

Foule Pointe is important for trade upon its own account, and a desirable situation, and likewise on account of its proximity to Tamatave, Fenerif, Antongil Bay, and St. Mary; but all these ports have the same disadvantage of being highly insalubrious. There is a fort at Foule Pointe of considerable strength, but inefficient in position, as troops can land out of its range.

The anchorage of Tamatave is one of the best and most frequented on the eastern coast, and the town contains from 800 to 1000 inhabitants. Near to it there is a strong fort, with a double enclosure, which caused great loss to the combined forces of the English and French, under Captain Kelly, at the time of the rupture between them and the natives in 1846. If common attention had been paid even to Lyall's journal it would have been seen that so far back as 1828 a very imposing square fort or citadel* had been erected with *four* fortified gates, in which Radama and hundreds of his suite resided, and it must stand to reason that with so many military officers and communications with civilized nations the Hovas would improve rather than demolish such a work.

Several fine lakes exist in this province, forming a series along the coast of upwards of 100 miles in extent. It was the project of the late King Radama to connect them together by canals, in order to facilitate the transport of produce from the southern part of the district by water. Operations were even commenced with 1500 or 1800 men at Tan-foutzy, between lake Tranga and lake Nosi-bé, but were abandoned after that monarch's decease.

A part of this district, near the forest of Fandrona, was once famed for its brigands, a class of men driven to desperation by the persecutions of the Hovas, who committed extensive depredations under shelter of the fastnesses which the impenetrable forests and caverns afford. In 1835 a considerable military force was employed in suppressing them; great numbers were taken and sent to the capital, where nearly 200 were put to death, 84 of whom were speared, 17 roasted alive, and the remainder, declared guilty by ordeal of the Tanghina, were killed upon the spot.

To the southward of Maroussie there is another thick forest, after which, in the direction of Manourou, the country abounds in plains and rice swamps. The water of the Manourou river is muddy and stagnant, and noisome herbs and plants cover its banks.

The Betanimenes and Betsimsarakas inhabit the greatest part of this district; they in general, however, go under the same name of Betanimenes, and are the people who have contributed more than any other in furnishing soldiers to the Hovas. Although their condition of servitude is most wretched, they are to a certain degree less humiliated than the other provinces, being allowed to carry the assegai: they are the only two tribes, with the exception of some of the inhabitants of Antankay, who are permitted this mark of confidence; and even they are not allowed to carry more than one assegai each man. The other tribes under the immediate

* It is, however, doubted whether this fort is the same that was attacked.

subjection of the Hovas are allowed to keep no sort of weapon whatever. The conquerors, trusting to the defenceless state to which they reduce the invaded provinces, for the maintenance of their dominion over them, invariably confiscate their arms, and do not allow them to carry even a stick.

The Betanimenes are forced to work upon every occasion by their oppressors, the Hovas, and entertain feelings of hatred which their degraded condition, and the severity they meet with on the least demonstration, prevent them from showing. At Foule Pointe particularly, their adherence to the Hovas is but of the slightest tenure.

The Affravarts are a tribe which inhabit the southern part of the province; they are muscular, brave, and frank, and their territory is rich in cattle. Near Va-bouaz, their chief town, there are some pottery works; and there is a plain sufficiently large, it is said, to manœuvre 400,000 men. Vatou Mandré is their frontier town on the sea-coast; and its anchorage, at the mouth of the Vatou Mandré river, is commodious; but the pass is choked up by a bar during several months of the year. It could, however, easily be opened, which is of importance, as it is the only safe anchorage to the southward of Tamatave. Maroussie, already mentioned, contains several rice stores built on piles.

The inhabitants of the Ambamvoule are frank and loyal: one of their principal villages is called Fidana.

The road to Tananarivo crosses this district, striking from the coast at Andevorande. It would be impossible to land at this river on account of the surf: large quantities of turtle resort to the sea shore near its mouth. At about a day's journey from this place towards the capital there is a thermal spring, called by the natives Ranou-mafau. In the forest, near Yvondrou, there is likewise a curious antique urn in granite, said to have been brought there by the Zafindramina, an Arab race.

The district of Betsimsaraka is subdivided into the three smaller provinces of Mahavelona, Tamatave, and Betanimena, but is more generally known under the designation of Betsimsaraka.

9. Anteva lies to the southward of Betsimsaraka, to the northward of Matitana, and to the eastward of Betsileo. Its principal town is Voni-bé, containing a small fort, occupied by Hovas and troops. Situated on the main road, it is always made by travellers from the southern districts; it has, besides, a direct communication with the capital, and another with Mananzari on the sea shore. The anchorage of Manourou is bad, and the pass narrow and difficult; the village contains a fort, with palisades, a ditch, and a drawbridge. Vessels frequently anchor here to take in rice, which is said to be the finest in quality of all Madagascar.

Mabela and Mananzari are the other important anchorages, from which also considerable quantities of salt beef are exported.

The cattle are brought down from the adjoining district of Betsileo to Tamatava, through Anteva.

The inhabitants are of the Betsimsaraka tribe, and, from their intercourse with Europeans, are much given to drunkenness. Their commerce was principally with the French.

10. Matitana is bounded on the N. by the province of Anteva, on the W. by Betsileo, and on the S. by Vangaïdrano. The country is flat and fertile towards the coast: rice, sugar, and cattle are very plentiful, and it is famous for the immense quantities of pork it produces. The inhabitants, called Antaymours, are supposed to be descendants of an Arab race; they are great fortune-tellers and workers of charms. The name of Zafindra-mina, a title of nobility, is sometimes given to them. The anchorage of Mananzari is very far from the sea-shore and not secure, although it is masked by a spit of sand covered with trees. The Antaymours have canoes, not adapted for sailing it is true, but excellent for passing over the bars of the Namour, Faraon, and Matatane rivers: it is surprising to see the ease and buoyancy with which these canoes cross the surf, and the address of the boatmen in the use of the short paddle.

11. Vangaïdrano is bounded on the northward by Matitana, on the westward by Ibara, and on the southward by Anosy. The country is flat and marshy, and very liable to fever. The productions are of the same nature as those of the neighbouring provinces; but a very small quantity of the territory is cultivated in proportion. The inhabitants are in general called the Andrambè; but this denomination is more applicable to the tribes of Afnisours, Antanosses, and Antifassi, which are under the immediate government of the Hovas, and are ruled by a Hova chief called Rasartikia, who resides in a village on the sea-coast called Andrambé.

The Chavoies and Chaffates of the southern part of the district appear to be savages, and to know nothing of either money or clothing: they rarely go out of their mountains.

The inhabitants of Manamboundri, in the Antayray country, are remarkable for their courage and independence; they are sometimes called the Antamassianacs: the country which they occupy is small in extent, but very fertile.

In July, 1826, General Brady was sent to subdue the Vangaïdranos province. More than nine months were employed in this expedition, the population being numerous and the opposition formidable. Rabedoka, the chief of the district, with upwards of twenty of his principal nobles, were taken prisoners; the first, on refusing to submit, was finally put to death. His nobles also,

with a fidelity and patriotism worthy of admiration, preferring to share the fate of their leader rather than acknowledge the sovereignty of Radama, were massacred in cold blood. 2000 of the inhabitants are said to have fallen in this war.

12. Anosy, S. of Vangaidrano and Ibara, and N.E. of Androy, is remarkable as the district in which the French first sought to establish their dominion in Madagascar. It contains several rich vales and two considerable lakes; one, highly bituminous near Mangafiaky, and another, in the interior, whose water tastes as if strongly impregnated with copper. Anosy is peopled by a very fine race and is well cultivated, but, like the other parts of the coast, extensive marshes render it extremely insalubrious. Fort Dauphin, the old French settlement, is now abandoned. Rock salt and saltpetre are found here; and the valley of Amboule produces spices and fruits, such as oranges and citrons, in great quantities, independently of the other general productions of the country.

13. Androy; 14. Mahafaly; 15. Frerenana; 16. Tsienimbalala; 17. Ibara, form the south-western extreme of Madagascar. The two first are inhabited by barbarous tribes, the others by mixed casts of the Betsileo and Betsimsaraka character. These districts have been but little explored, and are said to be thinly populated. They possess great numbers of cattle, which the natives dispose of on the sea-coast in exchange for ammunition and arms. The Androy province contains but little water: it produces large sheep, whose tails weigh as much as fifteen pounds, and a curious root which has the same properties as the water-melon. Fangahé, the capital of Androy, contains about 100 huts. Mataliti, another large village of 50 huts, is the next in importance.

Frerenana contains the considerable lake of Zhotry.

Mononga-bé, the capital of the Vronimes tribe in Ibara, contains 700 or 800 houses, and is well built and fortified. It was in an expedition against this tribe that a brave prince, Jean René, experienced such a total defeat during the reign of Radama.

Although these provinces seem tacitly to acknowledge the sovereignty of the Hovas, they at times give considerable trouble. The Ibaras and Tsienimbalalas are most expert with the musket, and are well supplied with arms from St. Augustin's Bay.

18. Menabé is bounded on the N. by Ambongo, on the S. by Fierenana and Tsienimbalala, and on the E. by Ankova and Betsileo. This province, the largest in Madagascar, is divided into North and South Mena-bé. The population is inconsiderable, compared with the extent of country; it is of the great Sakalava tribe, but appears to be a better cast of people than their northern neighbours.

The bay of Maroundava, the principal anchorage, is very unhealthy. The chief town, Menabé, called by the natives Andrefontza, is situated in the southern division, on the banks of the river bearing the same name, and at a short distance from a volcano, called Mount Tangouri, regarded as an object of superstitious dread by the natives. Mena-bé contains about 2000 houses; the royal dwellings consist of 15 or 20 large buildings in stone, surrounded by a triple-row of palisades. In a corner of the buildings there are some fine pieces of Portuguese cannon.

This province contains likewise a considerable lake, called Lake Ina by the natives: in its centre there is an island, inhabited alone by immense alligators. The northern part of Mena-bé contains great numbers of wild cattle. Radama and his officers, in one of his warlike expeditions amongst the Sakalaves, passing through this country, killed upwards of 340 oxen in one day for the use of his army, and two days afterwards 431 more were killed by the soldiers.

The commerce of this country belongs wholly to the Hovas through the following circumstance:—Radama, on his marriage with Rasalimo, daughter of Ranitrah, the king of the Sakalaves of Mena-bé, obtained the privilege for the Hovas to trade with the Sakalaves, on promising that he would not interfere with their territory. Radama made oath that he would not attempt the invasion of their lands; and the same conditions have since been ratified by Ranavalona Manjaka, the present queen. The Hovas have consequently the whole monopoly of the trade of this large province, and the Europeans are afraid to make overtures to the Sakalaves of Mena-bé on that account.

19. Betsileo is in the interior, between Mena-bé, Tsienimbala, Ibara, Matitana, Anteva, Antankay, and Ankova. This province is divided into North and South Betsileo, the chief town of which is Ambatou-mena, containing 1200 or 1500 huts. Betsileo contains a vast number of cattle, and produces sheep, goats, pigs, and haricots, besides most excellent pasturage. The scenery here is very picturesque, and offers some views of interest and great variety. Indications of volcanic action are distinct and numerous. There are likewise in this province several saline springs.

The inhabitants of Betsileo descend from the Betsimsaraka tribes; they are a false and treacherous race, and, although under the yoke of the Hovas, still they regard them as the usurpers of their territory. They seldom travel out of their country, which is filled with fastnesses, mountains, and precipices. They are of a warlike disposition, but have been deprived of their arms. Notwithstanding their enmity they do not make common cause with

the Ibaras and Tsienimbalalas, neighbouring tribes, who equally detest the Hovas.

20. Ankova is situated nearly in the centre of Madagascar, between the provinces of Ambongo, Antsianaka, Antankay, Betsileo, and Mena-bé. This is the most important province in Madagascar, and the most populated. It is subdivided into three districts of Vonizongo, Imamo, and Emerina; the latter is the most considerable of the three, and contains the city of Tananarivo or Antananarivo, the capital of the whole island and the seat of government. Ankova, though it has but few trees, and the capital is almost destitute of wood, the nearest forest being three days' journey distant, derives probably from that very circumstance the advantage of a fine climate and pure air, which make it the most healthy province of Madagascar, and equal in every respect to an European atmosphere. It may be considered hilly rather than mountainous, and its soil has been brought under sufficient improvement to maintain a large population.

Tananarivo, or Antananarivo, said to be situated in lat. $18^{\circ} 56' 26''$ and long. $46^{\circ} 57'$ E. of Greenwich, contains a population of about 25,000, including the villages around, but exclusive of the army. It contains about 8000 dwellings, and five or six very large houses. The town is watered by several small rivers, and is often inundated. Immense riches are said to be hidden in the tombs of the deceased kings of Emerina, near the capital.

Nearly in the centre of the city is the Tarpeian rock of Madagascar, called by the natives Ampahamariniana, where criminals are executed by being hurled headlong down the tremendous precipice. The fall of the unhappy victim may be about 60 or 80 feet, when he is inevitably killed, being dashed amid the scattered masses of broken rock projecting at that depth; the fall is then from 300 to 400 feet further to the base of the hill.

The next place of importance is the spot where the public Kabarys, or assemblies, are held; it is a large, open space, well suited by its natural formation for the purpose of assembling the people *en masse* to receive messages from the sovereign, and to transact all public affairs. This is also the place where the market is held at the capital. Neither booths, stalls, nor sheds are used, but all the articles are spread upon the ground, usually on mats, without any regard to symmetry.

The market day of Tananarivo is rather a day of pleasure than one of business; all the women appear in their best dresses, and the "cavaliers of Madagascar are equally observant of this day of fête."

Lake Itsa, in the Imamo subdivision, is celebrated for the quantities of excellent fish which it affords. A good open road

leads from it to the capital; but the ground is very irregular, and the distance considerable.

Nosi-Anivo, a village on the Antankay frontier, is on the road from the capital to the E. coast; it contains about 50 huts, is built on the brow of a hill, and is fortified with a deep ditch.

It is but fifty years since the Hovas have become known as a power; their tribe was formerly dispersed under the name of Ambouatanes (curs of pigs), an epithet of scorn. They are in fact quite a distinct race from the other Malgaseys. Always mistrusted and persecuted, they took refuge in the mountains of Ankova, and intermarried with the southern Sakalaves. They are considered superior in intelligence to the other people; the nobles are particularly shrewd and cunning, but the lower classes dirty and filthy to such an extreme that before their invasion of the island they were called the *Pariahs* of Madagascar. In general the character of the Hova is a combination of ferocity and talent; apt in deceit, they are with difficulty imposed upon, and politeness is with them a sure indication of coming treason. Avarice is their prevailing sin, and absorbs every feeling of friendship and connexion.

The demise of Radama, brought on by irregular habits during the latter part of his reign, was the death-warrant of all his relations, friends, and connexions, who were indiscriminately massacred by the ruthless tyrant who now rules with iron hand in Madagascar.

Immediately on the accession of Ranavalona Manjaka, who was both the cousin and wife of Radama, the reign of persecution against all foreigners and Christians commenced, and has never ceased until, with the exception of one or two Frenchmen, almost every tradesman, missionary, merchant, and Christian have been banished and expelled from this inhospitable land.

The rupture in 1846 was only the sequel of a continued and preconcerted system of insult and oppression, gratuitously offered to all strangers, and in which since her accession to the throne she has unceasingly persevered.

There is one star yet shining forth with some good augury over the future destinies of Madagascar. The son, named Racouto Radame,* of this most ferocious woman, and to whom she is said to bear the fondest affection, is a Christian, and openly and daringly avows his creed. He is a young man, they say, of studious habits and amiable bearing, but he has already displayed a dangerous firmness, and has been hardy enough to interfere in rescuing from the assegai or the boiling pit some Malgaseys who had been de-

* Likewise called the son of Radama, although born twelve months after that king's decease. He is now 21 years of age.

tected in the performance of Christian rites, and secreting others who had been found guilty of having a Bible in their possession.

Criminals or persons accused of Christianity are frequently thrown into a pit dug for the purpose, and boiling water thrown on them till nearly scalded to death, when an assegai is driven through their back.

If this young man does not fall by the assegai or tanghina, at the instigation of some of the demons who surround the queen, the renewal of friendly intercourse with Madagascar at a more distant period may not be despaired of; but it is much to be feared not during Ranavalona's life.

Her existence has, however, for several years been such a continuance of excess and debauchery that it is said her career is drawing to a close, and that she is so enervated as to have become now only the willing tool of her adroit ministers.

The Hova government is at present a tottering edifice, established by violence and maintained by the most severe despotism, distrust, and intimidation; the power of the monarch is absolute; her will is the only law, of which the nobles are the first ministers. The Hova officers and troops rank next in authority, and have the monopoly of the whole commerce as their privilege; they buy at the price they please, and sell at the price they fix. The right of plunder and of making slaves of their prisoners, another of their perquisites, is the cause of constant wars and invading expeditions into the neighbouring districts, and without the slightest grounds.

Tanghin, or trial by ordeal of poison, is had recourse to on the most trifling occasions, and the number of its victims is inconceivable to persons who have not witnessed the subtle effects of this baneful plant.

The queen alone can order it to governors and officers; slave-owners can likewise administer it to their slaves, giving previous notice to that effect to the authorities; and in this way whole villages are sometimes tried, but in common cases of litigation the judges, instead of ordering it to the parties themselves, give it to fowls, pigs, &c., and the cause is decided according to the result. In cases of debt the creditor has the right of repaying himself by selling the debtor with his wife and family into slavery, at the public market, however innocent the latter may be.

In 1830 a general purification of the country by ordeal was enjoined, and many hundreds if not thousands of Malgaseys are supposed to have been sacrificed.

The accused, having eaten as much rice as possible, swallows thin pieces of the skin of a fowl killed for the purpose, each piece about the size of a dollar, and swallowed whole. Three spoonfuls of rice are swallowed with each. A small quantity of the tanghina nut is scraped, and mixed with some juice of the banana, and given

him. After the recital of a formula of invocation, rice-water is given in copious draughts until a decision is made by vomiting the three pieces of skin, or being found unable to do so: in the former case the accused is declared innocent, and in the latter, guilty, and is struck or beaten with the rice pestle till dead, unless he has previously, as sometimes happens, died by the poisonous action of the *taughina* itself. There is, however, a great deal of favouritism shown, and it depends on the manner in which the poison is given whether it is fatal or not.

In fact, Tananarivo is the city of slavery, superstition, and cruelty. The queen, alarmed at the outbreaks of several tribes, has redoubled in severity towards them, and scarcely a day passes at the capital without several executions. At one time it was reported in Madagascar that the English were coming to fight; a demonstration was immediately made hostile to the queen, and the whole of the participators were subsequently executed.

In one of their expeditions to the southern coast, it is stated the Hovas deliberately assassinated on the spot not fewer than 10,000 men, who, on the faith of a treaty of friendship with the queen, had delivered up their arms.* All their wives and children above a given height, fixed on by the queen as a standard, were put to death likewise, and the remainder given to Emerina, and sold as slaves.

All the commerce of Madagascar with the Europeans seems to be carried on through the medium of the native women; it becomes therefore necessary to obtain their support and good will in all trading operations, and liaisons are frequently formed with them by the traders on that account.

During Mr. Powell's stay in Madagascar he was constantly invited to dine with the queen, who was very kind to him. She lives in some state; the dinners consisted of four or five hours' constant change of dishes, varying from fish brought from Lake Isa to hedgehogs. Her Majesty never appeared at table herself; but he had frequent occasions of speaking to her, but never at a distance nearer than ten or twelve feet. The throne was a sort of parapet ten or twelve feet high, and communicated by a passage to her own rooms, and with the court by a ladder, which was taken away until the audience terminated.

Dr. Powell says the queen is dark, and very much pitted with the small-pox, that she is the most superstitious of her own race, and believes the Europeans to be great magicians.

Among various reports on the subject of Ranavalona's accession to the throne of Madagascar, the following by Mr. Leeudenec bears some semblance of truth. Before Radama's accession to the

* This is no doubt an exaggeration.

government he had married a Sakalava princess of great beauty, to whom he was very much attached. When his uncle (Ranavalona's father), who was then king of Imerina, died, Radama had already distinguished himself in different successful wars against the Betsimarakas and other tribes, and was offered the crown by the Hovas, on condition that the legal heir to the throne should not be deprived of it. To this Radama reluctantly consented, and abandoned his beloved wife to share the throne of Emerina with Ranavalona, who was much older than Radama, and very ill favoured.

From a perusal of Lyall's diary it is evident that in Radama's time the Hovas were rapidly advancing in civilization, and that their military force was by no means contemptible. It remains to be seen whether, at the death of Radama and the accession of Ranavalona to full power, these promises of improvement have been carried steadily forward; or whether, on the contrary, which is more than probable, their military discipline has not declined.

During the reign of Radama there were several fine companies of artillerymen with fourteen pieces of brass cannon, viz., howitzers, and 2, 4, and 9-pounders. He was likewise attended by a body guard of 5000 janissaries, called the Sirondahs, mostly composed of African slaves. The standing army averaged 20,000 men.

Dr. Powell, one of the most recent travellers into the Ankova province, says that beneath the capital there is an artificial plain where he saw regularly once a fortnight as many as 2000 of the queen's troops exercised in the European manner; and it is pretty certain, from the general information given upon that subject, that the utmost endeavours would not enable the Hovas to raise more than 30,000 men, most of whom would be vassals.

One of the best defences of Madagascar against European invasion is the fever (called "General Fago," in Radama's characteristic style). The Hovas are fully sensible of the advantage they gain by keeping any foreign enemy within the reach of this formidable destroyer, and use every endeavour to temporize with and detain their enemies on the coast as long as possible. These tactics proved but too effective against the unfortunate expedition of the French under Commodore Goubeyre in 1829 and 1830.

Whatever may be the actual force on foot, it is certain that the present reign is one of terror, and that the influence of the Hovas over many of the provinces has decreased, and their invincibility received some severe checks within a short time. Very little exertion would blow these embers of disaffection into a flame, which once kindled would extend from province to province until the whole island had united in common cause against their oppressors.

It is the general opinion that if the abolition of slavery were

proclaimed by an invading force, not one of the districts would refuse to take up arms.

Boats might always ascend the river Mangorou, which is as broad as the river Hoogly at Calcutta. It is very deep, most limpid, and flows with a gentle current; the banks are beautifully lined with citron and orange trees, and the interior of the surrounding country is covered with masses of forest.

The Ikropa is the finest river within a considerable distance of the capital on its western side. It is crossed on the road to the Sakalava country by a rude bridge on four or five pieces of rough stone, and falls into the sea on the N.W. coast, not far from Mazangaye: it is known on the coast by the name of Bombetoc, and is navigable as far from the sea as Maroa-bé.

The Mangoro, or Mangoure, which empties itself into the sea in the Anteva province, is almost as broad as the Loire in France, but not so rapid, and is navigable a considerable distance into the interior. It traverses the main road from Andevorande to the capital, at about two days march from the latter, and its breadth at this place is about 60 feet. It swarms with alligators, and is generally crossed in canoes, but occasionally temporary bridges of bamboo are likewise made use of for that purpose.

Large canoes loaded with provisions have been seen at its lower extremity, which were said to have come down from the N. of the capital; but this statement is contradicted by many residents, who maintain that it is not navigable very far into the interior on account of its numerous falls and cataracts. It is said, moreover, that in 1832 the English Government, on the recommendation of their resident agent, had the anchorage of Manourou examined with the object of establishing a direct communication with the capital by means of this river.

The other streams of note are, on the W. coast, the Manangari, the Mantao, the Paraceyla, the Menabé, and the Artemout: on the E. coast the Manangoure, the Mananzari, and the Mananghare; and on the S. coast the Manandraie in the province of Androy. Most of these have been but little explored, and cannot be recommended for extensive water communication.

These rivers, as well as the lakes near Tamatave, are navigated in canoes of various sizes, some of which are built of planks. The Lakan Diafitch carries $1\frac{1}{2}$ ton with a crew of 6 men and a pilot; another, 20 feet by $13\frac{1}{2}$, carries $2\frac{1}{2}$ tons, 14 rowers and a pilot. The canoe of 9 benches carries 5 tons and 14 rowers; its length is 30 feet and its breadth 20.

In 1774 an interpreter went from Foule Pointe to Antongil Bay to meet Count Benionsky in a vessel of this description. It had on board 120 marinites or porters, 20 passengers, ammunition,

arms, and baggage, besides 20 rowers, making in all 160 men. They sail tolerably well, running about 30 leagues per day.

The broad extent of table-land in the interior is itself considerably elevated, and forms a base on which Ankaratra and other mountains rise. The highest peaks are probably not more than 8000 or 12,000 feet above the level of the sea, and consist of the Angaro, the Ambatouranga in Emerina, the Ankaratra, which forms the S.W. boundary of Ankova; and N.N.W. from Tananarivo the Tangogora, called also the Vigarora, in the N. extremity of the island.

Southward of Emerina is the cluster of mountains called Ankaratra; from these the high land continues for 40 miles, becoming more steep in the distance till it forms a chain of hills called the *Vara Vato* or Stone Mouth.

To the S. are the lower hills of Betsileo, and to the W. the division of Mandridrano. Ellis says those represented in maps as the *Ambohitsmenes* are probably the *Vohidrazana*, forming part of the forest of *Almanzotra*, and the highest section of forest W. of *Betanimena*. He likewise says that *Ambohitsmene* is a name unknown in the island.

There are but few roads in Madagascar, and at best they can only be considered as footpaths or tracks. The principal one leads from Tamatave to the capital, not in a direct line, but following the coast in a straight line nearly as far as *Andevorandé* before striking into the interior. The former portion is comparatively level, and the numerous lakes with which this part of the coast abounds have been turned to advantage for water-carriage, and are navigated by the larger canoes just described. It is to be regretted that Radama's project of connecting these lakes by canals has been abandoned; the operation of dragging the canoes overland from one lake to the other, and loading and unloading them repeatedly, is a considerable drawback in their navigation. Leguevel says that it took an hour to drag one of the large canoes from the River *Yvondrou* to Lake *Nosi-bé*, a distance of not more than 200 paces overland.

From *Andevorandé* to the capital (only 165 miles) the track is mountainous, and in some places as difficult to ascend as the *Pouce*,* or signal mountain of Port Louis. It runs through swamps, forests, and shaking bogs, covered with a net-work of grass. The forest of *Almanzotra* in particular is a continued succession of precipices and ridges, and the track is strewn with immense fallen trees, with rocks, and knee-deep puddles.

It is reported that another and a more direct road exists

* The *Pouce* is a very rugged and steep mountain, about 2500 feet in height.

between the capital and Tamatave which is kept secret from the Europeans.

There is also a road to the capital by Voni-bé according to some residents; but little dependence can be placed on such assertions, which it is very possible originate solely in the desire of the natives to lead Europeans astray as to the defenceless and factious state of the country.

The following abstract will show the number of days' journey between some of the most important places of Madagascar.

Route from Tamatave to Tananarivo, according to Leguevel:—

From Tamatave to Vabouaz across the lakes 3 days; from thence to Manamboundré 6 hours: this village contains at most 30 huts, and is surrounded by fertile grounds covered with provisions and cattle: close by there is a hot spring.

Bout Zenaar is a day's march from Vabouaz, and contains about 50 huts.

From Bout Zenaar to Ampassiombé is one day's march.

One day's march more to Maromanga, containing 10 or 12 huts.

One day's journey to Mainouf, a considerable village containing about 100 huts.

One day's march from thence to Nosiarivo, which contains about 50 huts. Like most of the other villages this is built on the brow of a hill, and is defended by a deep ditch. Provisions are very plentiful here.

Ambatou Manga is a day's journey from the preceding village, and half a day's march from Tananarivo. It is at this village that Europeans wait for permission to enter the capital.

List of resting-places at one day's journey distant, in travelling from Andevorandé to Antanarivo, by Mr. Baker:—

1. Ranoumafana.
2. Mahela.
3. Beforna, entrance of great forest.
4. Analamazaotra, middle of ditto.
5. Morrmanga, W. side of ditto.
6. Ambodiniangaro, in the Antankay country, followed by small forest.
7. Ambatomanga in Emerina.
8. Tananarivo.

Mr. Baker says that the road from Andevorandé to the capital is by far the shortest; he says he has travelled it in seven days, crossing the wood in one day.

Route of Leguevel with Jean René in his expedition against the Vionimes, with an army of Betsimsarakas, starting from Tamatave:—

Mitinandré . . .	3 days.	Benjee-makia . . .	6 hours
Vatoumandré . . .	1 "	Voula-mas . . .	6 "
Maroussie . . .	$\frac{1}{2}$ "	Ambou-Massia . . .	6 "
Manourou . . .	1 "	Voni-bé . . .	6 "
Taleva-lahé . . .	1 hour.	Azon-lahé . . .	7 "
Filoufac . . .	1 "	Ranouvola . . .	12 "
Amboudehar . . .	4 "	Raharaha . . .	6 "
Ratza Zennar . . .	6 "	Fihiraste . . .	6 "
Ombé Madinie . . .	6 "	Monhali . . .	6 "
Mahitzy . . .	3 "	Ompissa . . .	6 "
Zaza-kout . . .	8 "		

Continuation from Mananzari towards the south on the same expedition.

From Mananzari to Island of Kachimouk in a canoe	1 hour.
By coast to Namour	5 "
Namour to Faraon	1 day.
Faraon to Matitane	1 "
Matatane Point to Village, by river	1 $\frac{1}{2}$ hour.
Matatane by canoe to Sahada	1 day.
Sahada by swamp to Ampaminta	1 "
Ampaminta, in the wilds of the Chavoies and Chaffates, some days to Fahandza.	
Fahandza, S.W. to a river	1 day.
From river through the country of the Vrouimes, precipitous and mountainous, to Hantsylava	2 days.
Hantsylava to Mononga-bé	3 "
Mononga-bé to Sakaleon	4 "

Leguevel from Tananarivo to Boina.

2 hours to Arrivo.	
4 "	Antaroka, 50 houses.
6 "	A river.
6 "	Amboudrona, 100 houses, chief town.
6 "	Little River.
5 "	Beraviro, 50 houses, chief town.
6 "	Anacamousa, small.
5 "	A small waterfall.
1 "	Soriaminty, 60 houses, chief town.
6 "	Miadi, 60 houses.
6 "	Ankavalon, 15 houses.
$\frac{1}{2}$ "	Moromas, 150, fortified.
4 "	Nosi-vola, a lake.
	Rahidranou, 300 houses, capital.
12 "	Ankibou, 12 houses.
6 "	Folac, 6 houses.
6 "	Landi-foutchi, 6 houses.
8 "	Maroa-bé, 300 houses.
12 "	Zonna Androu by river, 40 houses.
14 "	Boina by river, 600 houses.

Liguevel, from Bay of Andrahoun near Fort Dauphin,	
4 hours to Mandzoulon	150 houses.
6 " Andracala	15 "
6 " Faranghoé, chief town	100 "
1 " Firaoa	20 "
10 " Matalili	50 "
12 " Afou-Vatou	30 "
6 " Fiassa	20 "
5 " Mahatal Ouzon	8 "

List of resting-places or villages at a distance of one day's journey from each other, as the natives reckon, in travelling up to Tananarivo on the W. side, by Mr. Baker.

Leaving Majamba and Majamba Bay.

1. Marovolo.	9. Anjoja.
2. Ampomby.	10. Tsorahafatra.
3. Ambatoranana.	11. Manantana.
4. Saropiroha.	12. Andranofassina.
5. Tsar-amassoandro.	13. Anosibé.
6. Andramy.	14. Ambato.
7. Amboassary.	15. Maherimandroso.
8. Ambohipolaka.	16. Antananarivo.

Starting from Majamba in Bombetoka Bay.

1. Fodilahimena.
2. Tsimilaotra.
3. Antoboaka.
4. Marovoy.
5. Betsiboka.
6. Trabonjy.
7. Ankoala.
8. Aminidafy.
9. Antsolalina.
10. Antongodrahoja.
11. Marotaolana.
12. Ambaratratra.
13. Vohobitra.
14. Tsorahafatra.
15. Andraopasina.
16. Sabasaotra.
17. Mangabé.
18. Ampontany.
19. Ampangabé.
20. Antananarivo.

Starting from Bottler's River in Boyana Bay.

1. Belembroka.
2. Miandrazana.
3. Ankazomainty.
4. Mahavary.
5. Beseva.
6. Androtra.
7. Bondrony.
8. Mananikia.
9. Andrenijia.
10. Ampanataorana.
11. Andriantohana.
12. Ambonimena.
13. Antsahamaina.
14. Manjakavaradrano.
15. Ambolotarafotsy.
16. Ambohinadrina.
17. Manankozo.
18. Amborampotsy.
19. Faratanjona.
20. Ambohijativo.*
21. Antalata.
22. Manankasina.
23. Asabotsy.†
24. Andriantany.
25. Antananarivo.

* Tuesday's market.

† Saturday's market.

[The accompanying Map of the interior of Madagascar has been constructed during short intervals, between my many duties in Mauritius, and since 1846, with the able assistance of Mr. Corby, Government Surveyor.—J. A. LLOYD.*]

HAVING but little further leisure, I have thought it better to submit at once the original and working map with all its faults. The coast line may be depended on as tolerably exact, having been reduced from the various nautical surveys; and many shoals, rocks, and rivers have been sketched in from detached charts and manuscripts which I have obtained a sight of. For the detail of the interior I cannot claim the slightest pretensions to correctness. It is only an attempt to form approximately some foundation for future inquiries, and more correct and extensive research.

A considerable part of the filling in has been borrowed from a map published with a small French octavo work on Madagascar, by M. Liguevel de la Combe, an intelligent trader, who made several desultory excursions into the interior, both previous to and after the death of Radama, the enlightened and liberal prince to whom may be attributed the conquest of the various provinces by the Hovas, and the sole opportunity ever afforded to the British Government of entering into friendly relations with the inhabitants of this extraordinary island.

During Radama's reign the British influence was in the ascendancy, and many zealous and intelligent men were from time to time invited over to Madagascar, and who laid the foundations of the present military knowledge and discipline of the natives, and contributed most materially to their advancement and perfection in various useful arts.

From these residents, and the diaries forwarded by them to the Mauritius Government,† I have extracted narratives of different journeys along the coast and in the interior. They consist of the marches of Brady, an English private of the 22nd Foot, sent over to drill Radama's troops, and who became one of his generals of the 11th, or highest honour;‡ also of those of Mr. Hastie and Mr. Lyall, who were at different times agents there.

Mr. Hastie's manuscripts in particular give a number of routes to and from the capital, when travelling alone, or in company with King Radama, on his distant military expeditions; and they have, as well as the travels of Lignevel, been laid down and "fitted in" until they offer something like a verification of one another.

These again have been submitted to the inspection of some of the missionaries, and particularly Mr. Baker, a most intelligent person, who, having for some years resided with the Christian missions, had made several journeys to the capital, and set up a printing establishment for Malgasey translations of religious works.

Mr. Baker, besides affording me much information, and the advantages of his experience, gave me a rough sketch of the whole island, as

* A large map of the same, by Colonel Lloyd, has lately been published by Mr. Arrowsmith.—Ed.

† As well as from Ellis's Madagascar and Lignevel.

‡ The highest honour is the 13th.





subdivided into provinces according to the Hova Government, which I have endeavoured, from the routes, the rivers, and the contour of the mountains, to follow out.

I have from time to time added what further information I could collect, both by notes and orally, from some very intelligent traders, such as Lecudonnee, Laconfourgue, Jonas (who married a relation of the present tyrant queen Ranavalona), Vincent, Furey, and many others; besides Malgasey Christians and Marmites.* I have embodied the whole as well as I could into one narrative in preference to classifying them under different heads.

J. A. L.

V.—*Abstract of MSS. Books and Papers respecting Madagascar during the possession of the Mauritius by the French.*
Presented by Sir W. M. FARQUHAR to the British Museum.

(These documents were brought to England by the late Sir R. Farquhar from the Mauritius, and appear to have been extracted and copied from the French Archives.)

[This Abstract was made and presented to the Royal Geographical Society by W. J. HAMILTON, Esq., April, 1850.]

I. (1) Three Volumes of Dictionary, French and Madagascan, Title—

‘Dictionnaire Français et Madecasse. Divisé en trois Colonnes. La première renferme le mot Français dans l’ordre alphabétique et le mot Madecasse le plus usité dans l’idiôme du Sud.’

‘La seconde, le mot Madecasse le plus usité dans l’idiôme du Nord.’

‘La troisième, les mots donnés à la langue, d’après des élémens connus.’

‘Par Barthélemi Huet Chevalier de Froberville, ancien Capitaine d’Infanterie,’ &c., &c., &c.

In the *Preface nécessaire*, the third column is thus described: ‘La troisième celle des mots que j’ai donnés à la langue. Celle-ci seule a besoin d’explication.’ This is explained further on to mean the words which the author has introduced in addition to those already published in former Vocabularies and Dictionaries. These are very faulty, full of errors and omissions. The errors are corrected in the first volume, the omissions are made good in the third. Some grammatical details are also given in this introduction.

II. (2.) Five volumes of Dictionary, Madagascan and French, interspersed with many long notes and details on the different words and objects of natural history introduced, as well as political and geographical terms alluded to, *e. g.*

Antatchimes. Name given by the inhabitants of the north of Mada-

* A ‘Marmite’ is a Malagash labourer who accompanies and takes charge of cattle.

gasear to all the people dwelling between the southern bank of the Manghourou and Cape St. Mary.

Antavaratehs. People of the north; followed by a long description.

Atsimou. South, South pole, Southern provinces. 'Les Naturels de Madagascar divisent leur isle en cinq parties;' followed by a long description.

Betanimene. Le peuple qui habite toute cette partie de la côte de l'Est qui git entre le territoire de Tamatave en descendant vers le sud, et la rive nord du Manghourou, &c. &c.

Coracora. Limaçon; followed by a description of several fine species of *Helix* and *Bulimus* (en forme de *Buccins*).

These volumes evidently contain much valuable information for the history and natural history of the island.

The fifth volume contains at the end of the dictionary several interesting supplementary dissertations on various subjects connected with the geography and natural productions of Madagascar. Amongst these the following subjects may be mentioned:—

1. *Zafferaminis.* A people of the north.

2. *Zaffé bourahé.* The same people, inhabiting the island St. Mary. The language of Madagascar contains many Phœnician roots, and the author attributes this circumstance to the dispersion of the fleets equipped by Solomon at Eziongeber to procure gold from Ophir, supposed to be on the coast of Zanzibar. The greater part of Solomon's sailors were Phœnicians.

3. *Zafidienbilous.* Another people of the island.

4. *Madagascar* according to M. Legentil. A description of the island, its resources, and advantages to French commerce, followed by 'An anonymous account in 1750.

'An Account of the Island,' by Flaccourt, 1661, followed by

'Projet d'établissement.' Colonization, &c., followed by

An account by M. de Cossigny (1773-1802).

'Projet d'établissement.

'Madagascar,' suivant Fressanges (1806).

_____, suivant M. Rondeaux (1813).

_____, suivant M. Lescalier (1792).

_____, suivant M. L'Islet Geffroi (1814).

5. *Famourane.* 'On the Practice of Circumcision.'

6. 'On the Island Nossé hibrâhim, Nossé bourahé, or L'isle S^{te}. Marie,' taken from the different authors above-mentioned.

'Sur l'établissement des Français à l'isle Ste. Marie et de sa ruine.'

'Actes de Concession et Prise de Possession de l'isle Ste. Marie de Madagascar.'

7. 'Marotte, Marosse Maroi, or Nossi-Manghabé (island).

8. *Madagascar* (2nd notice).

'De Madagascar,' suivant M. de Mandave (1767). 'Projet d'établissement.'

_____, suivant M. Rochon (1780).

_____, suivant M. Mayeur.

9. Anossi Androbeigaha, or Carcanossi. 'On the productions of Fort Dauphin (Province d'Anossi), propres au commerce et à la vie.' 'Notice Historique sur l'Etablissement Français du Fort Dauphin (Province d'Anossi).'

10. 'Manghabé ou Baie d'Antongil.' Description of its position and advantages.

Notice sur le Comte de Beniowsky et l'établissement qu'il fonda à la Baie d'Antongil en 1774.

III. (3.) An original copy of a French and Madagascan, and Madagascan and French Dictionary. Very dirty, written on coarse, hard, brown packing-paper. Each page is divided into two columns, one being headed 'Français et Malgache,' the other 'Malgache et Français.' Towards the end the word is written Madegasse.

IV. (4.) History of Madagascar in 2 vols., entitled:—

'Mémoires pour servir à l'histoire de l'isle de Madagascar, redigés, mis en ordre, et publiés sur les notes Manuscrites, de Messrs. Mayeur, Dumaine, et autres, et enrichis des extraits de plusieurs Voyages anciens et modernes. Par M. By. Buet Chev. de Froberville, ancien Capitaine d'Infanterie. A l'isle de France en Afrique, 1809.'

In the preface the author says:—"Trois races d'hommes très distinctes occupent le sol de cette grande isle. Les naturels de la côte de l'ouest ont beaucoup de rapport avec les habitans de la côte d'Afrique vis-à-vis laquelle elle est située. Ils ont les cheveux courts et crépus. &c. &c. La seconde est celle (blanc) dont l'existence à Madagascar est un problème, qui n'a de rapport ni avec celles de la côte de l'est ni avec celle de la côte de l'ouest." They appear to be Malays.

'La troisième est celle qui habite les côtes de l'est, la plus belle, la mieux conformée. Les hommes sont grands, bien faits, ils ont la figure ouverte, les traits nobles, &c. &c. Je les crois descendans des Juifs; l'isle de Ste. Marie, l'isle d'Hibrahim, Ile de Quint, enfans d'Abraham.'

'L'unité de langage parmi tout ce peuple est encore un problème, vû la différence de leur origine.'

The first volume commences with the following:—

Collection de Voyages dans l'intérieur et sur les côtes de l'isle de Madagascar.

Premier Voyage.

'Voyage de M. Mayeur, interprète du Gouvernement, dans le nord de Madagascar en 1774.'

This is followed by 'Notes et Eclaircissemens' on various subjects; then, Note Géographique, Historique, et Etymologique de quelques noms propres Madecasses, et de quelques noms de peuples, villages, montagnes, divisions, &c., dont il est parlé dans le Voyage du Nord.

Second Voyage.

'Voyage au Pays des Séclaves, côte Ouest de Madagascar,' Avril, 1774, par M. Mayeur.

This is followed by 'Notes et Eclaircissemens' en forme de lettres, pour le Voyage au Pays des Sclaves.

Troisième Voyage.

'Voyage au pays d'Ancove autrement dit des Hovas ou An-boilambes, dans l'intérieur des terres, Isle de Madagascar, Janvier, 1777. M. Mayeur.

Ce voyage fut entrepris sous le nom de Mission secrète, par les ordres de M. le Baron de Beniowsky, Commandant pour le Roi à l'isle de Madagascar. Il eut pour objet de visiter une partie des côtes en avançant vers le sud, de pénétrer, s'il y avait lieu, dans l'intérieur des terres vers le S. O., de connoître les pays, la nature de leurs productions, les objets d'échange qui conviendraient à un commerce stable, de sonder les dispositions des peuples sur des alliances, de faire connoître en un mot le nom Français dans les régions où il n'avoit point encore pénétré. J'étais à Foulepointe, côte de l'est, lorsque ces ordres me parvinrent. Je fis mes préparatifs en conséquence et fixai mon départ au 20 Janvier, 1777.

At Enkissikissic he says: 'Les jours suivans je parcourus les campagnes. Elles me parurent arides, le sol ingrat, les plantes sans vigueur; les bois y manquent totalement.'

At *Engua-la sola* (Engualla solla)—'Le pays abonde en mines de fer qu'ils exploitent. La soie, le coton l'indigo se trouvent à *Endrantsaye*.'

This is followed by 'Notes et Eclaircissemens des lacs de Noussevay, de Mouasse, et de Rangué.'

Quatrième Voyage.

'Voyage au pays d'Ancove, par le pays d'Ancaye, autrement dit des Baizangouzangoux.' Juillet, 1785. M. Mayeur.

'Les notes de ce Voyage ne m'ont point été communiquées,' par M. Mayeur, &c. 'They came through the hands of a M. Dumaine.'

Followed by Notes—'Armes offensives et défensives des Madécasses. Leur manière de faire la guerre.'

Cinquième Voyage.

'Voyage à Ste. Luce, à Baquik, à la Ville d'Amboule, Isle de Madagascar,' par M. L'Istet Geffroi, Officer du Corps du Génie. 1787.

Sixième Voyage.

'Voyage au pays d'Ancaye, autrement dit des Bezounzouns, isle de Madagascar.' Par M. Dumaine, chef des Traités. Juillet, 1790.

Septième Voyage.

'Voyage à la côte de l'Ouest, autrement dite Pays des Sclaves.' Janvier, 1793. Par M. Dumaine, chef des Traités pour le Roi à Madagascar.

'Idée de la Côte de l'Ouest de Madagascar.' Depuis Anconala, situé au Nord jusqu'à Mouzourdava, autrement dit Menabé.

'Rapport sur l'utilité dont cette partie de côte peut être au commerce Français.'

Huitième Voyage.

'Voyage à l'isle de Madagascar.' Par M. Lescallier, traduit de l'Anglais (Monthly Magazine). April, 1805.

Neuvième Voyage.

'Voyage à l'isle de Madagascar.' Par M. de Flaccourt. An 1648. Extrait et abrégé du Voyage de M. de Flaccourt.

This account gives a worse picture of the character of the Madecasses than all subsequent writers.

Ce qui suit trouve ici naturellement sa place parce que Flaccourt n'est satisfaisant que pour la partie du Sud ; et le tableau sera complet avec les notions sur le Nord, extraites de M. Rochon, qui a été assez bien servi à cet égard.

Réflexions sur la partie du Nord de Madagascar, extraites des Voyages de M. Rochon. Very valuable notes are added to the text, tom. i. p. 258. Some of the subjects are—'Des Pirates,' 'Roine de l'établissement de Ste. Marie,' 'De Beniowsky,' 'Des Quimos, Mémoire de M. de Modave' (The notes deny the existence of this race of dwarfs), 'Du Fort Dauphin,' 'De la Baye d'Antongil.

'Notions Générales sur les Madecasses, extraites du Voyage de M. Rochon.

'Continuation du même sujet. Extrait des Voyages de M. Le Gentil, dans les Mers de l'Inde. 1761.

'Mélanges extraits de divers Auteurs et Correspondances particulières.

The second volume is entitled 'Mémoires pour servir,' &c. Tome 2.

"Projet d'établissement à Madagascar, soumis en 1660 à la Compagnie des Indes Orientales, par M. de Flaccourt, sous le titre d'Avantage qu'on peut retirer pour la Religion et le Commerce d'un Etablissement de Colonies à Madagascar."

M. Flaccourt resided many years on the island, and his account of the productions of the island is valuable.

Precious stones of all sorts are said to be in great abundance.

'Réflexions sur l'Ile de Madagascar, par M. de Cossigny.'

He describes the various productions of the island.

'Discussion sur le Choix du Lieu propre à faire un Etablissement à Madagascar,' par M. de Cossigny.

The amiable qualities of the inhabitants are everywhere insisted on.

'Correspondance et Observations de M. de Mayeur sur le Projet d'Etablissement à Madagascar,' présenté par M. de Cossigny.

"Ce fut pendant la publication en 1804 d'une partie des mémoires précédens dans les journaux de l'Isle de France, dont j'étais rédacteur alors, que commença mes liaisons avec M. Mayeur. . . . Il ignorait que j'avais reçu des ordres pour ne pas aller plus loin. Il m'écrivit . . . pour m'offrir tous les secours dont je pourrais avoir besoin dans un travail sur Madagascar. C'est cette correspondance que je publie aujourd'hui."

These letters are full of interesting details. See Letter 17, on 'Liaisons with Madagascar Women.'

Dixième Voyage.

'Voyage à la Baye de S. Augustin, Côte Occidentale de Madagascar, par M. Capmartin. 1804.'

Interesting account of the Bay and surrounding country.

'Remarques sur Engoutsy, autrement dit le Cap de l'Est, Côte Orientale de Madagascar.'

"Extraits de quelques feuilles éparses d'un Journal de Navigation, dont l'auteur m'est inconnu."

This is followed by a 'Vocabulaire Malgache et Français,' full of corrections and additions, therefore evidently original; list of minerals, &c.

'Histoire de Ratsimila-hoe Roi de Foulepoint et des Be-tsi-micaraes.' Preceded by an introduction; 'Lettres de l'Editeur à l'Auteur.'

V. (No. 12). 'A Volume of Reports, &c.,' with the following note on a fly-leaf:—

"Ce registre est un recueil fait pour mon usage d'extraits de journaux, mémoires, livres divers, tant publiés qu'inédits. La seule pièce intéressante qu'il renferme est la première, intitulée, *Mémoire sur Madagascar*. Elle est souvent citée dans mes notes au 'Vocabulaire Madécasse,' sous le nom de *Mémoire*, ou *Auteur Anonyme*." "Monsieur le Gouverneur a toutes les autres dans les livres de MM. de Cossigny et Legentil."

"Le 'Projet d'Etablissement proposé par Flaccourt,' remis en style moderne, et qui en fait aussi partie, se trouve au Vocabulaire à l'article '*Madagascar*.'"

"Le présent recueil a sa suite dans le volume No. 6 du 'Vocabulaire Madécasse.' Comme son Excellence a le livre de M. Legentil dont cette suite est extraite, je crois qu'il serait bon, pour éviter la confusion, de biffer les vingt ou trente premières pages de ce sixième volume qui lui deviennent inutiles. Alors ces six volumes se trouveraient être exclusivement le 'Vocabulaire Madécasse,' et ses Notes.

(Signé) "DE FROBERVILLE."

"Avis de l'Editeur."

"Le Mémoire qui suit doit commencer la collection des pièces sur Madagascar. Il n'en est pas de mieux fait, de plus exact, et de plus précis, il est la meilleure préface qu'on puisse donner à un recueil de ce genre. Il est bien à regretter qu'il ne soit pas parfait. La description des provinces du Nord et de celles des Hoves ainsi que la conclusion manquent."

The same volume contains 'Mémoire sur la Côte Orientale d'Afrique, par M. de Cossigny.'

After describing its productions, he insists on the advantages of a colonial establishment being founded by the government.

'Sur la Déclinaison et l'Inclinaison de l'Aiguille Aimantée à Madagascar' (extrait du Voyage de M. Le Gentil dans les Mers de l'Inde, vol. ii. p. 626), p. 139.

Amongst the many articles contained in this volume are the following:—'De l'Isle Diego Roys;' 'Fort Dauphin;' 'Ebb and Flow of the Tides;' 'De la Pointe à Larrée;' 'Description de l'Isle Marotte;' 'Des Différentes Espèces d'Hommes qu'on trouve à Madagascar, et s'il y a des Pigmées;' 'Mœurs, Coutumes, Génie des Habitans de la Côte de l'Est de Madagascar;' 'Tamsimilo, Roi de Foulpointe;' 'Mœurs des Madécasses, leurs Armes, Façon d'appréter la Viande; Soufflets de leurs Forges;' 'De la Pêche de la Baleine et de la Circoncision;' 'De la Navigation de Madagascar, et de la Monnaie;' 'De quelques Termes de la Langue Madécasse.'

VI. A second volume of 'Collection of Reports,' in continuation of the last. It contains the following letter:—

"A S. E. Monsieur Farquhar, Gouverneur-Général des Isles Maurice et Dépendances.

"Monsieur le Gouverneur,—J'ai l'honneur de vous adresser trois MSS. qui complètent la livraison des ouvrages que je me suis obligé de fournir à votre Excellence.

"Le premier est un MS. en trois volumes, contenant le 'Dict. Franc. et Madécasse' (le Franc. avant le Madéc.). Je vous prie d'avoir la bonté de jeter un coup d'œil sur la préface dont la lecture est nécessaire pour comprendre la distribution de l'ouvrage.

"Le second est le catéchisme abrégé à l'usage de ces peuples en un cahier de papier non relié.

"Le troisième, un recueil des pièces détachées, extraites de divers ouvrages et mémoires, tant publiés qu'inédits, et qui figurent dans la collection comme pièces justificatives.

"Il ne me restera plus à fournir à votre Excellence que le *petit Dict. des Noms de Lieux*, qui n'est qu'ébauché, et auquel il m'est impossible de travailler sans avoir sous les yeux les MSS. qui en contiennent les élémens. Ces MSS. sont renfermés dans les deux gros volumes reliés, et couverts en peau jaune, qui ont fait partie de la première remise que j'ai eu l'honneur de vous faire le 26 Décembre dernier. Si vous voulez avoir la bonté de me les faire parvenir je m'en occuperai de suite. Je suis, &c.

(Signé)

"DE FROBERVILLE.

"Port-Louis, ce 9 Février, 1816."

'Mélanges Extraits du Voyage de M. Legentil.'

Amongst the memoirs or extracts in this volume are the following:—'Erreur sur le Gisement de Madagascar soupçonnée;' 'Description de l'Observatoire de l'Auteur à Foulpointe;' 'Résultat des Déterminations de la Longitude du Fort Dauphin;' 'Réflexions sur la Salubrité de la Baie d'Antongil'—(it should rather be on the unhealthiness); 'On Port Luquez;' 'Du Serment de Sang chez les Madécasses;' 'De la Population des Bêtes à Cornes à la Côte de l'Ouest;' 'Des Moyens à employer pour en tirer de bonnes Salaisons;'

'*Rava* sur les Ruines, Monumens; &c. ;' '*Vadine Bazaka* sur les Femmes d'Etrangers;' '*Talili*;' 'Conte, Histoire, Fable, Récit;' 'Description du Madécasse, ou Malgache, Habitant ou *Insulaire de Madagascar*,' containing a full account of their character, manners, and customs; 'Description of Wild Cattle;' 'Bœuf des Bois,' and 'Bœuf Sauvage,' two species; 'Sur la Pêche des Baleines;' 'Suite de la Description de Foulepointe;' (The Harbour dangerous, except in fine weather:) it concludes with 'Observations Météorologiques sur les Vents et la Chaleur, les Marées, Etat de la Mer, &c. ;' 'Notice sur les Quimos Kimos Kimosse,' a pretended race of pigmies: (no such race exists;) 'Notice sur la Religion des Madécasses, sur le mot *Zanhav*, Dieu, l'Etre Souverain, le Principe de toutes choses.'

VII. (No. 9). 'Index Géographique,' in three *cahiers*; very full and complete.

'Index de la Géographie de Madagascar, dressé sur les Itinéraires de MM. de Flaccourt, Mayeur, Dumaine, Fressanges, et autres Voyageurs Modernes, par Barthelémy Huet Chevalier de Froberville, Ancien Capitaine d'Infanterie,' &c. &c. &c. &c.'

VIII. (No. 7). 'Catéchisme abrégé à l'usage des Madécasses, par M. l'Abbé Ant. Flageollot, Prêtre de la Mission de St. Lazare, &c. &c., revu, corrigé et augmenté par Barthelémy Huet Chev. de Froberville, &c. &c.'

"Ce Catéchisme est celui qu'avait fait M. l'Abbé Flageollot pour son propre usage dans le temps où il se destinait aux missions de Madagascar."

'Extrait du Voyage de M. Mayeur dans le Nord de Madagascar, Province du Cap d'Ambre.'

"M. Mayeur fut accompagné dans ce voyage par M. Corby, Officier des Volontaires de Beniowsky."

'Mémoire sur l'Utilité et la Nécessité de former un puissant Etablissement dans l'Isle de Madagascar.'

"Observation Particulière.

"Plusieurs rapports confirment celui qui a été fait à Monseigneur sur le séjour du Sr. de Beniowsky à Londres.

"On ajoute même que le ministre Anglais s'est décidé à adopter le plan du Sr. Beniowsky pour former un établissement à Madagascar.

"Sans mettre plus de valeur que de raison aux démarches de cet indigne aventurier* si familier avec la trahison et toutes les espèces de crime, on pense cependant qu'il serait prudent de s'assurer de la vérité de ces rapports par l'ambassadeur du Roi à la cour de Londres.

"Et dans le cas où effectivement cette cour se disposerait à faire un armement pour Madagascar, on est d'avis d'envoyer ordre au Gouverneur de l'Isle de France d'expédier sur le champ un bâtiment avec quelques petits détachements pour prendre possession au nom du Roy des trois principaux points de la côte de l'est de Madagascar," &c. &c.

* The use of this expression seems to be owing to his attempt to put down slavery.

' Précis des avantages d'un Etablissement à Madagascar.'

' Mémoires sur Madagascar.'

1. "Mémoire intéressant sur l'Isle de Madagascar, où l'on développe les avantages immenses de profit et de gloire que la France pourrait en retirer et où l'on donne un aperçu des moyens qui doivent en assurer le succès."

2. "Plan et développement des moyens qui doivent assurer la Solidité de l'Etablissement proposé à Madagascar, avec les détails des avantages immenses que la France retirera de cette colonie."

3. "Mémoire sur les moyens de former pour le Roi dans l'Isle de Madagascar un Etablissement de Culture, de Commerce, et d'entrepôt pour l'Europe, l'Asie et l'Afrique, par Siette de la Rousselière, Lieutenant des Milices Nationales de l'Isle de France."

4. "Mémoire sur la Nécessité de former un puissant Etablissement à Madagascar."

5. "Observations Particulières sur Beniowsky."

6. "Précis des avantages d'un Etablissement à Madagascar."

The three last papers do not appear in this parcel.

' Vocabulaire Français et Malgache.' (Very short.)

' Réflexions sur l'Etablissement et l'Amélioration du Commerce de Madagascar.'

(Signé)

"MAYEUR.

"Le 22 Ventose, au 10^{me}."

' Aperçu de mon Dernier Voyage à Ancova, l'an 1808.'

(No. 2)—No. 64.

(Signé)

BME. HUGON."

Full of interesting details of the country.

' Essai sur Madagascar.' (No. 41.)

No name. A general statement of the island, its productions, and capabilities, and manners of the inhabitants.

' Mémoire sur l'Administration et le Commerce des Isles de Madagascar et des Seichelles.'

"Notice sur la Nécessité de s'occuper sérieusement du Commerce de Madagascar." 'Mémoire de MM. Guiard et Le Gueune sur la Traite qui se peut faire à Madagascar en Octobre 1783.' Advantages of different localities. 'Mémoire sur l'Isle des Seichelles.'

' Copie d'un Exposé sur quelques Parties de l'Isle de Madagascar (présenté à S. E. le Gouverneur Farquhar), par M. Hebel.'

Interesting details of geography.

No. 131. 'Productions de Madagascar'—'Moyens d'Agriculture et de Commerce'—'Etat Moral, Intellectuel, et Politique de ses Habitans,' &c. &c.'

No. 132 contains description of trees by name, followed by remarks in English on different objects of natural history, animals, plants, fruits, roots, &c.—List of persons of rank and titles.

IX. (No. 12.) 'Essai Théorique sur la Langue Madécasse,' in three cahiers. On the title-page:—

'Le Grand Dictionnaire de Madagascar: Ouvrage dans lequel ont été recueillies toutes les observations faites sur cette grande isle depuis FLACCOURT jusqu'à nos jours, intéressant les *Mœurs anciennes et modernes* des Insulaires, le *Commerce*, la *Navigation*, l'*Histoire naturelle* du Pays en ce qu'elle a de connu; les *meilleurs Systemes* à adopter pour sa colonisation, divers *Projets d'Etablissement*, &c. &c.; la *Langue* de ces Peuples *analysée* dans chacun de ses Mots, *ramenée à ses Elémens les plus simples*; une *Grammaire générale* précédée d'un *Discours préliminaire*, dans lequel on analyse la *Langue*, on développe son *Genre* et le *Mécanisme* de ses Mots, par Barthélemy Huet, Chev. de Froberville, &c.'

"1ère Partie. De quelle langue dérive la Madécasse—De l'unité du langage—Des qualités de la langue Madécasse—De l'écriture à Madagascar—Des idiômes—Des Grammaires du Madécasse.

"2de Partie. Des mots—Des différentes parties du discours—Du substantif—De l'adjectif—Du verbe—Des caractéristiques en général—Des caractéristiques de Verbes—Des caractéristiques de substantifs—Des caractéristiques de tems de verbes—Des caractéristiques d'agence—Des caractéristiques de sujets de verbes passifs—Des caractéristiques de lieu, 3 sortes—De l'orthographe—De la prononciation.

"3me Partie. Grammaire."

X. 'Histoire de l'Isle de Madagascar, par M. de Flaccourt, Directeur-Général de la Compagnie Française d'Orient et Commandant pour S.M. dans la dite Isle et isles adjacentes. A Paris, l'an 1658. Remise en style moderne par Barth. Huet, Chev. de Froberville, &c. Isle Maurice, 1816.'—Only ten thin cahiers.

Fragment of an old Mémoire in bad condition, written with some humour, *e.g.*:—"On demande la latitude et longitude de l'isle de Madagascar. — Réponse. Une bonne carte géographique instruirait mieux sur cette question qu'un militaire qui ignore l'art de connoître la position des terres relativement aux astres.—Dem. Les noms des rivières qui l'arrosent? Rép. J'ignore les noms de la plus-part des rivières qui coulent en France ma patrie; celles de Madagascar, qui m'est une terre étrangère, me sont plus inconnues."—Some of the information is given in the form of letters written by Madegasse inhabitants to their friends.

'Letter of instructions, dated Paris, 24 Avril, 1790, forwarding decrees and instructions of the National Assembly of the 8th and 28th of March. (Signed) 'LA LUZERNE.'

'Notes sur la Baye St. Augustin, Côte occidentale de Madagascar. (Signé) 'CAPMARTIN,

'à bord du vaisseau le Marengo, le 1 Avril, 1804.'

XI. (No. 2.) A volume of various documents bound together, of which a list is placed at the head of the volume.

"Table des Pièces à relier sous le titre Madagascar:—

1. 'Lettre du Capt. Lynne de l'Eclipse à M. S. Roux.' Summons to surrender Tamatave, and reply.

2. 'Idées sur un Projet d'Etablissement à Madagascar.'
3. 'Lettre à S. Ex. sur Madagascar.'
4. 'Questions et Réponses sur Madagascar.'
5. 'Notice sur les Causes des Maladies à Madagascar.'
6. 'Voyage à Ste. Luce par Lislet Geffroy.'
7. 'Etat des Postes pouvant être occupés par la Traitte des Ris le long de la Coste de l'Isle de Madagascard, depuis Manourou jusqu'au grand Manang-han en allant du Sud au Nord.'
8. 'Prospectus d'Etablissement à Ste. Luce et Fort Dauphin.'
9. 'Supplément au Prospectus cy-dessus.'
10. 'Etat des Citoyens Français habitant la Partie Sud en l'an 14 (1806).'
11. 'Déclaration de quelques Traitans de Foulpointe sur la Gamelle de Riz.'
12. 'Lettre adressée à M. Telfer traitant d'un Voyage à Madagascar.'
13. 'Lettre du S. Chochot, Voyageur Naturaliste, au même. 3 Mars, 1815.'
- 16 and 17. 'Deux Lettres du S. Rondeaux.'
- 18 and 19. 'Etats des Présens faits aux Chefs en 1784-1786.'
20. 'Relevé des Employés morts à Louisbourg depuis Mars, 1774, jusqu'à fin de Septembre, 1776.'
21. 'Etats des Volontaires de Beniowsky morts de 1773 à 1776.'
- 22, 23, and 24. 'Instructions pour les Chefs de Traité, Lavat, Lafevre, et Tellot.'
25. 'Note de Bâtiment au Fort Dauphin l'an 12 (1803).'
26. 'Pétition des Traitans de Foulpointe, 1807.'
27. 'Seize Lettres de M. S. Roux par ordre de dates.'—These letters refer to the government of French settlements in Madagascar, and contain details of intercourse with the natives—supply of rice for Mauritius—and are dated from Tamatave.
28. 'Cinq Lettres de M. Léon de Lahoussaÿe.'—Same subjects, with some geographical details. Tamatave, May, 1807—June, 1807.
29. 'Six Lettres de M. Chardenoux.'
30. 'Seize Lettres de M. Tellot.'—Details of natural products.
31. 'Quatre Lettres de M. Jekell.'
32. 'Une Lettre de M. Perrot.'
33. 'Une Lettre de M. Lagardère.'
34. 'Copie et Traduction de l'Autorisation donnée par S. M. l'Empereur Joseph II. au Comte de Beniowsky.'—This paper is missing from the collection.
35. 'Cinq Originaux d'Ordres et Instructions du Comte de Beniowsky.'
36. 'Procès-verbal de Dépôts contre le Comte de Beniowsky.'
37. 'Ordre de Bonfilioli, Secrétaire dudit.'
38. 'Huit Lettres Originales du Comte de Beniowsky.'
39. 'Deux Lettres de son Secrétaire.'
40. 'Quatre Lettres de M. Dumaine à M. de Beniowsky.'
41. 'Deux Inventaires de Lettres relatives à M. de Beniowsky.'
42. 'Une Pièce de Recette signée "Michel," mais de la Main de Beniowsky.'

43. ' Une Liste d'Effets de la même Main.'

44. ' Mémoire pour les Chenilles Soieuses de Madagascar.'

XII. (No. 16.) A volume of letters with the following table of contents :—

' Notes sur les Lettres de M. Chapelier contenues dans ce volume.

1. ' Vers à Soie, Teinture du Fil de raffin.'

2. ' Arraiguées Soyeuses, Préparations de la Racine de Vaha-laingou, de celle d'Hounitch, et de l'Ecorce de la Tige de Vaha-bontou pour teindre en Rouge.'

3. ' L'Indigo et le Coton prospérant à Madagascar, les Cannes à Sucre monstrueuses; huit Espèces de Palmiers manquant ici (Isle de France).'

4. ' Envoi de plusieurs Plantes et d'un Minerai de Fer à essayer.'

5. ' Présent pour le Chef Suprême des Hovas.'—Omitted in the list.

6. ' Envoi d'un Cocon de Ver à Soie se nourrissant sur l'Anpalé ou Mûrier à Fruits verts.'

7. ' Envoi de Plantes.'

8. ' Dissertation sur la Plante la Ponga (*Nepenthes distillatoria*), ou Porte-burette.'

9. ' Envoi de plusieurs Plantes et du Hola-tafou Contrepoison.'

10. ' Paquets en Coton nommés *Toutou-ranou* fabriqués par les Hovas propre à habiller les Troupes; riche Mine de Fer exploitée chez eux.'

11. ' Envoi de Plantes et de Bûcher de l'Histie, Bois à Teinture Rouge fort commun.'

12. ' Grand Eloge des Productions de Madagascar—Bassanier Nain, son Utilité.'

13. ' Détails sur la Nourriture et l'Education, &c. du Ver à Soie—Arbres et Instruments de Musique.'

15. ' Mine de Fer à Saha-dahetch à une grande lieue dans le Nord de Tamatave.'

16. ' Prix des Bœufs, &c. — Envoi de Plantes — Hofa, nouvelle Espèce de Vacona — Plantes dans les lieux humides — Pyrites sulfureuses.'

17. ' Envoi de la Teigne qui produit la Chenille de la Soie Jaune.'

18. ' Envoi de Plants—Échantillon de la Soie Jaune—Bois de Calaba—sept Espèces de Tatamaka très propres à la Construction Civile et Navale, produisant une Résine odorante—Quarz découvert à Velinpou et Christaux de Roches hexagones.'

19. ' Traduction Malgache du 83^{me} Psaume de David.'

20. ' Autre Traduction Malgache.'

21. ' Vœux que font les Malgaches lorsque leurs Femmes ou Enfants sont dangereusement malades.'

22. ' Découverte d'une Espèce de Pyrite pouvant fournir une bonne qualité de Soufre et de Fer—Découverte d'une Mine de Fer pouvant donner de 60 à 80 l^{rs} per quintal.'

23. ' Envois de Graines—Dissertations—Annonce de Détails sur les Mœurs, &c., des Malgaches.'

25. ' Remarques sur les Rapports qui existent entre les Langues

Malgache, Taitienne, Zélandaise, Malaise, et Espagnole—Observations sur l'Histoire de Madagascar de Raynal.'

26. ' Formule d'Usage en donnant et recevant un Présent.'

27. ' Appel des Dieux Supérieurs et Evocation des Manes, avec Notes.'

28. ' Formule d'Usage pour l'Epreuve du Feu par le Fer.'

30. ' Envoi de Grains, &c., avec détails.'

31. ' Envoi de Plantes, avec détails.'

32. ' Résine-gomme Vazouane pouvant remplacer le goudron — Vouëne-t'-Soukinef, huile bonne à manger.'

33. ' Envoi de Plantes—détails.'

Dans un ordre du Préfet à MM. Tellot et Jekell mention d'eaux thermales.

36. ' Apprêts du Cuir chez les Malgaches.'

37. ' Quelques Détails sur la Guerre entre Caci et Tsi-manguéha.'

38. Idem.

39. ' Envoi de Plantes—détails.'

40. ' Une Lettre de MM. Tellot et Jekell contenant quelques Détails sur les Arbres de Madagascar—Travaux qu'exigent les Rizières —Travaux que requièrent les Habitations à Riz—Variétés de Riz cultivées tant dans les Rizières que dans les Habitations.'—Details of different races and manners and customs of the Madagassess.

XIII. A bundle of loose papers, memoranda, *brouillons*, calculations of finance, copies of decrees and *règlements* of the Assemblée Nationale, procès-verbal de l'Assemblée Coloniale respecting local disturbances and quarrels in 1791; local decrees and laws; De la justice criminelle. Papers bearing date from 1736 to 1811.

XIV. (No. 13.) A small bundle of papers headed

" Diverses Pièces très endommagées relatives à Madagascar :—

1. ' Explication sur le Tatouage et Figures y relatives.'

2. ' Notes—Signification de divers Mots Malgaches en Français.'

3. ' Formule de Serment Malgache.'

4. ' Observation sur l'Amadou des Malgaches.'

5. ' Vocabulaire des Principales Parties du Corps Humain selon l'Idiome de Be-tsi-miscaraen, avec la Conjugaison des Noms des dites Parties.'

6. ' Note sur la Pierre à Feu de Madagascar.'

7. ' Note relative à la Conchyliologie—*Solen*.'

8. ' Minute d'une Lettre d'Envoi au Gouverneur-Général de diverses Graines et Objets d'Histoire Naturelle.'

9. ' Une Note contenant diverses Phrases en Langue Malgache et quelques Mots Français à la Mémoire de Michaux, voyageur.'

10. ' Série de diverses Phrases et Mots Malgaches.'

11. ' Une Table de Calcul depuis 1 jusqu'à — Brasses.'

12. ' Diverses Demandes et Réponses en Malgache.'

13. ' Notes sur le rafin, les Parties et l'Usage qu'on en fait.'

14. ' Sur la Non-Existence du — Nain dit Quimosse.'

15. ' Note relative à l'Arrivée à Madagascar des Agens du Directoire Baco et Burnet.'

16. 'Prophétie Turgotine.'

17. 'Diverses Notes relatives à l'Histoire Naturelle—Arbres, Arbustes, Plantes, &c. de Madagascar, leurs Espèces, leurs Genres, leurs Classes.'

18. 'Notes diverses sur l'Isle de France, sur les Hottentots, sur les Colonies d'Amérique, sur les Effets de la Lumière du Soleil sur les Corps Organiques, Mots empruntés des Grecs.'

XV. (No. 17) to (No. 133.)* A large bundle of papers of a similar character: official correspondence between English and French authorities, drafts of despatches. Amongst them are—

'Treaty for Abolition of Slave Trade between Sir R. Farquhar and Radama' (133).

'Historique de Beniowsky' (70).

Note on Productions and Trade of Madagascar, 'réunies par M. de Chagal en 1816' (72).

'Note sur Madagascar' (73).

'Vocabulaires, &c., Cérémonies et Usages de Madagascar' (83).

'Notes on relative Names of different Madagascar Tribes, North, South, East, and West' (84).

'Notes sur Madagascar' (88)—(signé) 'Lami. 1816.'

'Essai sur Madagascar' (89).

'Notes sur Madagascar prises sous la Dictée de M. la Salle.'

'On the different tribes and nations (91).

'Tableau comparatif des Instructions données par le Capitaine-Général aux différentes Personnes envoyées par lui à Madagascar, avec les Résumés de leurs Rapports et les Résultats de leurs Opérations' (124).

'Instructions pour M. Chardenoux' (124).

Notes for Queries on Madagascar 'par son Excellence,' (125.)

'Prospectus for publishing Dictionary' (130).

'Extrait des Registres des Arrêtés du Capitaine-Général' (130).

'Essai sur l'Île de Madagascar' (130).

'Instructions sommaires qu'il est convenable d'adresser aux Agens du Gouvernement à Tamatave et à Foulpointe, Isle de Madagascar' (130).

'Instructions pour M. Rondeaux aîné, Commissaire Civil à l'Isle de Madagascar,' signed 'R. T. Farquhar' (130).

It appears that all these documents were collected by Sir R. Farquhar for the purpose of obtaining information to complete the publication of the great Dictionary of the Madagascar language prepared by De Froberville.

XVI. Printed,—*'Catéchisme abrégé en la Langue de Madagascar pour instruire sommairement ces Peuples, les inviter et les disposer au Baptême.'* Printed by the Propaganda at Rome.

XVII. 'Memoir and Notice explanatory of a Chart of Madagascar by Lislet Geoffroy. London: J. Murray. 1819.'

* These numbers are all in red ink.

VI.—*Despatch communicating the discovery of a Native Written Character at Bohmar, on the Western Coast of Africa, near Liberia, accompanied by a Vocabulary of the Vahie or Vei Tongue.* By Lieut. F. E. FORBES, R.N. Communicated by the Admiralty. Read April 23, 1849.

[Some difficulty has been experienced in printing the following paper on the Vei language in consequence of there being no typographical means of representing the peculiar alphabet in which the language is written; and as the number of characters is above 200, the expense of cutting a fount of types for the purpose would have been very great. This difficulty has been avoided by the adoption of a syllabarium in Roman types, in which every character of the native syllabarium is represented by a syllable corresponding, as nearly as our knowledge admits, with the sound of the character as given by the native Africans. In those cases where several native characters have apparently the same sound, they are here distinguished from each other by accents or other marks: it will thus be understood, for example, that *bo*, *bó*, *bò*, *bõ*, *bō* represent five different characters. It must be remembered that the accents are solely used to distinguish the several characters, and that they do not influence the sound of the vowels, except the circumflex, which gives the *a* the sound of *a* in water. It is intended that the other vowels should be sounded as in Italian; that the *g* should be always hard, as in *go* and *get*; the *j* as in *joy*; *n* like *ng* in *singer*; *ng* as in *finger*; *gb* shows a sound common to several African languages, which Lieut. Forbes has generally represented by *p*; *ng*, *nh*, and *hn* represent three characters which are probably all sounded alike; the sound is stated to be a kind of hum made with the lips almost closed.

Reasons will be given in the notes appended to this paper for believing that the sounds of the Vei words thus represented will be as correct as those produced by pronouncing the words according to the systems given by Lieut. Forbes, or by the Rev. Mr. Koelle.

With the exception of this substitution and the omission of the separate alphabet of Lieut. Forbes, the paper is here given as written by that officer. The lithographed alphabet, which contains all the forms that have been met with in the different MSS., will include that of Lieut. Forbes.]

H.M.S. "Bonetta," Sierra Leone, Jan. 18, 1849.

Sir,—It has fallen to my lot to make a discovery of such importance to the civilization of Africa, that I am anxious my own profession should bear the honour that it may deserve.

The discovery consists of a written language of the Phonetic order.

On my arrival at Sierra Leone I did myself the honour to report the discovery to his Excellency the Acting Governor; and, at his request, furnished him with a copy of the characters, alphabetically arranged, which his Excellency purposed sending

to the Secretary of State for the Colonies. In a service letter upon the subject I made use of the following expression:—"To the Admiralty, the head of the profession to which I have the honour to belong, I deem it my duty to forward a vocabulary I have arranged."

By his Excellency I was strongly recommended to send the vocabulary to England as early as possible.

The curiosity of the discovery brought people of all classes in Sierra Leone to witness it; and among others the missionaries—to these men the more astonishing, one of their Society being a man of sound philological learning. The following is the copy of a letter I received from the senior Missionary of the Church of England, the Rev. Ed. Jones, M.A. :—

"I am unwilling that you should leave our shores without expressing to you how deeply I feel your kindness in favouring me with a sight of your African vocabulary. I trust your most praiseworthy exertions amid the arduous duties of your profession will lead to ulterior measures, and that steps will be immediately taken to pursue what you have so spiritedly begun, and thus satisfy all that the interests of philology and the cause of African improvement may demand. It does seem a strange thing (for truth is strange) that at a point of land within a few days' sail of us, and immediately bordering upon an American colony, it should be left to a naval officer, actively engaged in the suppression of the slave-trade, to bring to light the existence of a written language previously, so far as I have any means of judging, altogether unknown. This is your just merit, and I cheerfully acknowledge it."

I have had the pleasure of receiving from Mr. Roberts, the President of Liberia, an assurance that the language is a novelty to him, and he did me the honour to request I would furnish him with a copy of the characters.

Hoping this communication may meet your approbation, as well as the good opinion of their Lordships,

I have, &c.

(Signed) F. E. FORBES,

Lieut. R.N. Commanding H.M.S. "Bonetta."

To Commodore Sir Charles Hotham, K.C.B.,
Commander in Chief West Coast of Africa,
&c. &c.

At Cape Mount, on the house of one of the Liberian settlers, I chanced to meet the following characters—"kó i si a wa ké mu."* Never having heard of an African language of the kind, I inquired, and discovered them to be of a native language of late introduction or invention. For some time I failed in getting them explained, or in obtaining any further information on the subject.

A lucky chance took me to a town called "Bohmar," about 8 miles E. of Cape Mount, and there I met a man by the name

* See fac-simile on the second lithograph.

[illegible]

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of Mormorro Dualoo Wohgnæ, a nephew of the King of Sugury, who possessed a manuscript and understood the language.

On this man consenting to live on board her Majesty's ship, I undertook to arrange the inclosed vocabulary, having collected and classed all the characters his book contained.

It will be observed that the language is of the Phonetic order; that the characters are not symbolical; and, according to my teacher, it was invented ten or twenty years ago by the following eight men:—

	Native Character.
1. Duaroo-Kehloe-Kaie.	Dua du ke ra gai.
2. Fargan-Zapoh.	Fa nge sa gbo.
3. Duaroo-Boh-Kehlae.	Dua du bù ke ra.*
4. Hhumdongloh-Wooloh.	Ng ro lo ulo.
5. Duaroo Tamee.	Dua du tá mi.
6. Bahee Behseh.	Bá i bí sé.
7. Karnahmar.	Ga na ma.
8. Kanlee fohloh.	Ká i fò lo.

“Mormorro Dualoo Wohgnæ” thus writes his name:—Mo mo du dua du wóyé.

He informs me that at first the language was studied by many, and that schools were established; but that such extraordinary signs of civilization aroused the jealousy of their Spanish neighbours at Gallinas, who, by intrigue and presents, soon laid the whole country into such a state of anarchy as overthrew the progress of learning.

If the language be one of such recent origin, or even an introduction, how far we must have mistaken the African's constitution!

The present vocabulary has been a work of upwards of three months' constant study, and has been revised four times.

I cannot think I am possessed of all the characters. However, my teacher assures me there are no more.

A VOCABULARY.

PHENOMENA.

English.	Native Character.	Pronunciation.
World	du nya	doo ñah
Sea	kó i	qua ie
Sun	te le	taí lee
Moon	ga lo	kar loh
Star	to ma la	to ro mar la
Light	du ma ga	doo mar ka
Dark	du ma fi	doo mar fee ng
Sunrise	te ga du ma	taí lee ka doo mao

* This is obviously the Doalu Bukara of the Rev. Mr. Koelle.

PHENOMENA—continued.

English.	Native Character.	Pronunciation.
Sunset	te bi la	tai lee bih la
Heat	gbá ni	pann dee
Cold	ki ma	kee mar
Night	su dong	su loh
Day	te dong	tai lee loh

ELEMENTS.

Fire	tá	tah
Air	a i fi la gbó a	ah ee fee lah bo ah
Earth	du ma	doo mar
Smoke	ji	gee
Water	si si	se se
Wind	fi la	fee lah
Calm	fi la bé le	fee lah bih lee

SENSES.

See	ja já	eah jay
Hear	ja la	eah lah
Smell	ku e	ko ña
Feel	bu sâ dong	boh sor dong

SYMMETRY.

Body	mo fi ma	moh fee mar
Head	ku	kung
Hair	ku ri	kung de
Eye	ja	ja
Ear	to ro	to roh
Face	ja dong	tar roh
Mouth	jó (?)	la
Nose	sung	sung
Chin	gbá kó ro	pah ko loh
Arm	bó	boo
Hand	bó lu va lo	boo loo far loh
Finger	bó lu dóng le	boo loo dong lee
Leg	ké ne	kai ñee
Foot	ké ne ja lo	kai ñee jar loh
Toes	ké dóng le	kain dong lee
Back	kó	koh
Belly	bú	boo

MALADIES.

Deaf	ja we le ko lo la	ah wee ly ko loh da
Dumb	{ a to lo gbo ti mu	ah to loh poo tee le moo
Blind	mu mu	moo moo
Idiot	a bi le mo já	ah bil lee mo jay
Mad	a ku ra nya	ah ku lae ña
Lame	a bu lo wa	ah bo loh oar
Wound	a ma gbá	ah man pah
Fever	gbá a	pa ah
Sick	a ma ni gbá di a	ah ma nee pan dee ar
	a ki la	a hi kee lah

RELATIONS.

English.	Native Character.	Pronunciation.
Father	fa	fa
Mother	ng ba	hhum bah
Husband	na ga	nah kar
Wife	na mus ¹	nah moo su
Man	ga i	kai ee
Woman	mu su ma	mu su mar
Brother	nyo mo	gno moh
Sister	nyo mo mu su ma	gno moh mu su mar
Son	na deng	nah ding
Daughter	na deng mu su ma	nah ding mu su mar
Boy	deng ga i ma	ding kai ee mar
Girl	deng mu su ma	ding mu su mar

HOUSE, &c.

House	ké	kain
Door	ké la lo	kain dar roh
Window	ja le la lo	jayn dee lah loh
Thatch	ja la	jan dah
Wood	sâ	so ro
Room	só ri lo	zoh de loh
Table	ma sa	mar sar
Bed	gbé gbé	ping pih
Seat	gbe ye	bih ngae
Mat	wa la	oar lah
Pipe	tá wa la	ta oar lah
Tobacco	tá wa	ta oar

FOREST.

Forest	fi la bá wo la	fee la bah woh la
Tree	kó ng	koang
Bush	wá gbó	jaum boh
Bough	a bó dǒng	ah boo loon
Trunk	kó ng té	koang tih
Leaf	ja ng bá	ja hhum bah
Flowers	kó fu	kon foo
Fruit	kó pǒng	kon pong
Shade	si le kó lo	su elee a kor loh
Bark	kó fú lu	koang fo loo
Thorn	wa le	wah lee
Roots	kǒng su lu	koang soo doo
Creeper	ju du	juh doo

ARMS, &c.

Spear	tá bá	tam bah
Sword	mí yé	mee ñae
Musket	bù	boh
Powder	bù ng	boh fǒung
Cannon	do bá	doo bah
Fowling-piece	se dǒng	seh doong
Powder-flask	fu u	vou loo
Musket-ball	bù kó je	boh ko enjae

ANIMALS.

English.	Native Character.	Pronunciation.
Bull	ni ga i ma	gneë kaie mar
Bullock	ni	gneë
Cow	ni mu su ma	gneë mu su mar
Goat	bá	bah
Sheep	bá wa la	bah oar la
Pig	kó nya	ko ñah
Leopard	ko ri	ko de
Deer	ké la	kain la
Elephant	ga ma	kar mar
Dog	u du	woo doo
Cat	ma nya le	mar gnah elee
Rat	to la	to la
Mouse	ding ri	ding de
Musk-rat	do du	doo loo
Bush-cat	ko le gbé le	ko lee pih lee
Lion	ja la	ja la
Tiger	su du gbo	su leo poo

BIRDS.

Fowl	ti ea	tee ea
Duck	bú dong ko ri	boh loh kon dee
Eagle	kó ng ja	quan ja
Snipe	gbo lo ma se be	po lo mar seh mbeh
Palm bird	kó si a	ko se ah
Dove	pong u	poh woo
Turkey	do gbá ke ko deng	doo pah ke kon de
Toucan	gbé a gbé a	pih ah piah

FRUIT.

Orange	du bú lo	doom boo loh
Pine-apple	ké fé	kain fae
Plantain	bá na	bah nah
Banana	po ng bá na	poro ba nah
Cocoa-nut	po ng kó ea	poro kon jae
Guava	kó ri wa	ko le oar
Paupau	pa ga i	pah kaie

VEGETABLES.

Pumpkin	gbo du	po loo
Yams	sí na bé le	ce nah beh lee
Cassada	tu sa	bah sar
Sweet potato	jo u	joh woo
Rice	kó ro	ko loh
Onions	sí bá la	se bah lah
Chillies	ki la fé	kee lah fae
Beans	sá	sor

METALS.

English.	Native Character.	Pronunciation.
Gold	ga ni ja le	kar nee jar lee
Silver	ga ni gbè ma	kar nee peh mar
Copper	tá ni	ta gnee
Brass	bang bang té ra	bang ban teh lae
Iron	ku du	kung doo
Tin	gá gá	gon gong
Charcoal	ké bú	kain boo

MINERALS, &c.

Diamond	ni na si ng	nee nah seng
Glass	me sé ra	meh neh lae

SPICES.

Salt	kó	koh
Pepper	ki le fe	kee lee fae
Oil	do du	too doo

MEATS, &c. &c.

Meat	su yé	soo yea
Bullock flesh	ni su yé	gnee soo yea
Goat flesh	bá ne yé	bah soo yea
Bread	gbó ng	boh foo
Flour	gbó ng mu	boh foo mun
Fish	nyi	gnea

DRINKS.

Palm wine	bá gbè	bang peh
Spirits	po ng gbè	poro peh
Rum	gbè	peh

COLOURS.

White	a gbè ma	ah peh mar
Black	fi ma	fee mar
Yellow	nye le	ñae lee
Red	ja le	ja lee
Green	ji ro	gee dong

CLOTHES.

Clothes	dóng fíng	doung fíng
Cap	gbo lo	boh loh
Shirt	dóng ma	doung mar
Trowsers	ké ko la	kain kon lah
Shoes	kó wa	ko oar
Black handkef.	bí tá gbá sa	fee ta pah sar
Cloth	mu lu fu	moo luh fuh
Piece cloth	ko la	koh lah
Country cloth	ga ro ko la	kan doh ko lah

TIMES, &c.

English.	Native Character.	Pronunciation.
Year	sang	sang
Month	ga lo	kar loh
Morning	sa ma	sar mar
Evening	te le lo	teh lee loh
Noon	te le ku té	teh lee kun teh
Midnight	su té	su tih
To-day	sâ ro ro	sor don do
To-morrow	si na	se nah
End	a bá he	ah bang he
Beginning	a ku du mi	ah ko ro mee
Rainy season	sa ma lo	sar mar ro
Dry season	ko ri ma	ko le mar
Land wind	u la lo fi la	woo la loh fee lah
Sea wind	kó i lo fi la	qua ee loh fee loh

PRONOUNS, &c.

I	ng nya	hhum gar
Thou	i wa	ee oar
He	ga i me	ka ie meh
We	mugbe	mun bih
You	i wa	ee oar
They	mo me nu	moh meh noo
Who	wâ mu	jauh mun
Which	a me na	ah me nah
My	tá mu	tah mun
His	a tá mu	ah tah mun
Ours	mu tá mu he	mun tah mun he
Yours	i wa tá mu	ee oar ta mun
Theirs	a nu tá mu	ah noo ta mun
Each	ke ke	keh o keh
All	a gbè ra	ah peh lae
Neither	ro ro gbè ra	don do peh lae
This	ke	ke
That	kè me nu	keh me noo
Some	ng kó deng	hhum ko ding
Other	a ma deng	ah mar ding
Such	ke tá lo	keh ta roh
More	ng u gbó lo la	hhum worro bo riola
None	a gbè deng	ah peh ding

NUMERALS.

1	ro ro	don do .
2	fi la	fee lah
3	sa gbá	sarc pah
4	na ni	nah nee
5	sâ du	sor doo
6	sâ du ro ro	sor don do
7	sâ du fi la	sorn fee la

NUMERALS—continued.

Native Character.	Pronunciation.
8 sâ du sa gbá	sorn sare pah
9 sa du na ni	sorn na nee
10 tá ng	tang
11 tá ng ro ro	tang don do
20 mo bá le	mo ban dee
21 mo bá le a kó ro ro	mo ban dee ako don do
30 mo bá le a kó tá ng	mo ban dee ako tang
31 mo bá le a kó tá ng ro ro	mo ban dee ako tang don do
40 mo fi la bá le	moh fee lah ban dee
41 mo fi la bá le akó ro ro	moh fee lah ban dee ako don do
50 mo fi la bá le akó tá ng	moh fee lah ban dee ako tang
51 mo fi la bá le akó tá ng ro ro	moh fee lah ban dee ako tang don do
60 mo sa gbá bá le	moh sack pah ban dee
61 mo sa gbá bá le a kó ro ro	moh sack pah ban dee ako don do
70 mo sa gbá bá le a kó tá ng	moh sare pah ban dee ako tang
71 mo sa gbá bá le a kó tá ng ro ro	moh sare pah ban dee ako tang don do
80 mo nani bá le	moh nar nee ban dee
81 mo na ni bá le akó ro ro	moh nar nee ban dee ako dondo
90 mo na ni bá le a kó tá ng	moh nar nee ban dee ako tang
91 mo na ni bá le a kó tá ng ro ro	moh nar nee ban dee ako tang dondo
100 hoh ro ro	hun de ro don do
1000 tá su ro ro	taow su don do

ADJECTIVES.

English.	Native Character.	Pronunciation.
Able	ku la	koun dah
Acid	a dó ng la	ah don lah
Aged	ka ki la	karn kee lah
Agreeable	kó ni	koh nee
Alike	nyo gbi	neagh beih
Alive	a ke ra	ah ken dae
Bad	a ma na	ar mar gne
Barren	a gbé ma le mu	ah peh mar lee moo
Bend	i du	ee doo
Boiling	a u ri	ah woo dee
Broken	i ga ri	ee kar dee
Careful	i ku ma fé ra gbà gbà	ee ko mar feh lae pang pang
Cheap	a sà woh ma gbè ra	ah song woh mar peh lae
Clean	a ko le	ah ko elee
Clever	i ko sa	ee koh sar
Cloudy	bá la gbi la	ban da beih lah
Complete	a ku be le mu	ah kung ben dee mun
Drunk	gbé bi la	peh bi lah
Dry	a gbá la	ah pah la
Empty	a fó lu mu	ah fo loo mun
Enough	a ku la	ah kung dah
Equal	ng kó tá	hhum kon tah

ADJECTIVES—continued.

English.	Native Character.	Pronunciation.
Female	su	su
Few	a ma fíng fá	ah mar fíng far
First	a se je se je	ah sen gee sen gee
Fit	a ku lá gbé	ah kung dal ping
Future (?)	ja lo	jar loh
Free	ma ja deng	man ja ding
Glad	a ng va lá sa	ah hum far lá sar
Great	a sá wó be le	ah song woh bil lee
Hard	a gbè ra	arc peh lae
Heavy	a va nya	ah far ña
High	a ga ró ja ng	ah can doh jang
Hot	a gbá rí a	ah pan deah
Hungry	kó ng wó	kong woh
Jealous	a mu su va lá	ah mu su fá lá
Ignorant	a ma ko sa	ah mar ko sar
Improper	a ma ma	ah mar mar
Laborious	a gbo ró wí ra tu	ah poh loh wee lae too
Large	a ko lu	ah koo loo
Last	a gbè me	ah peh ne meh
Late	i a fè ja ja	ee ah feh jan ja
Less	a ku ma ko lu	ah kung mar ko loh
Long	a ja ng	ah jang
Loose	i fò le	ee foo lee
Lost	a sa ma	ah sar mar
Male	ka í	ka ie
Middle	a té ma	ah teh mar
More	a gbó lo	ah bo roh
Near	nu be fò	noo beh for
New	a na ma	ah nah mar
Next	a ró ma le	ah roh man dee
Numerous	a ku du bá	ah koor um bah
Old	a kó lo kó lo bá mu	ah ko loh ko loh bah moo
Open	i dá ga	ee dar ka
Past	a be le a	ah beh lee ah
Poor	ja mó mu	jar moh moo
Pretty	a nyí gbá	ah gueae pah
Quick	i ná rí a rí a	ee nah dee ah dee agh
Rapid	a lo gbá rí a	ah loh pan dee ah
Same	a tá ró	ah tar roh
Short	a í ku du	ah ee kung doo
Sick	a kí lá wa	ee kee lá oar
Slow	i má tá rí a	ee mar tar de ah
Soft	a ma gbè lá	ah mar peh lae
Strong	a nge ná	ah gar nah
Sweet	a hí nya gbá	ah kee ña pah
Thirsty	ng kó jí ní a mí	hhung ko gee nee ah mee
Timid	a mí ní nya	ah mee nee ña
True	tán uya mu	tau ña moo

ADJECTIVES—continued.

English.	Native Character.	Pronunciation.
Unequal	a ma ga ng	ah mar kang
Unwilling	ma da lu	mar da roo
Useful	na i ri a	nah ee dee ah
Useless	ma lu lu a la	mar oo too a lah

VERBS.

Abuse	a gbé ra ja u	ah peh lae ja oo
Accept	i gbi la je	ee beh la enjae
Accuse	a tá ko só ri na	ah ta ko seh di nah
Answer	i wi kó le	ee vee qua lee
Arrive	a ké	ah kay
Ask	i to sa	ee to sar
Assist	i bá sa la	ee bar sar la
Bargain	a sá wó na	ah sor woh gnee
Beat	ng be bú a	hhum beh boo ah
Beg	fu ra ke	foo lae kae
Begin	i ku du bi	ee koo roo bee
Believe	i sa la	ee sar la
Bind	i ki ri a kó	ee kee lee ah ko
Boil	i ki ng	ee kee ng
Bring	i na la	ee nah lah
Buy	i a sa	ee ah sang
Call	i ké le	ee kain lee
Carry	i tá la	ee ta la
Catch	i bi la	ee bee la
Chew	i ro	ee dong
Collect	i la só	ee dar song
Come	i na	ee nah
Count	i la ng	ee dang
Cut	i tehi	ee tehea
Dance	mu tá ro ke	mun ta dong ke
Deliver	i tá kó	ee ta ko
Destroy	a ro ja lu	ah ro ja oo
Die	a fí la	ah far la
Double	a si na ma	ee se nah mar
Divide	u i té du	oo ee teh doo
Dress	i ma ki ri	ee mar kee dee
Drink	i mi	ee mee
Eat	feng ro	fung dong
End	a bá ng	ah bang
Explain	i ro ji la ng la	ee roh gee lang dah
Enter	i dóng	ee doung
Invite	i ké bá la he	ee kain bah la he
Go	i tá	ee tah
Kick	i ma ng té	ee marn teb
Kiss	i la dóng ng la lo	ee da doung hhum dah loh
Kill	i fí	ee far
Know	na sá	nah sor

VERBS—continued.

English.	Native Character.	Pronunciation.
Laugh	i já ra ke	ee jay lae ke
Lend	ng si na	hhum see nah
Lie	i fá ni	ee far gnee
Live	i fé la gbó	ee fe la boh
Love	na i ri a	nah ee de ah
Look	ng fé ra	hhum feh lae
Make	i na a	ee gnee ah
Move	i bi	ee bee
Occupy	a be nu	ah bih noo
Open	i la ga	ee dar kar
Owe	a gbá gbi la ng bó lo	ah pang beh la hhum boo loh
Paddle	da la	dar lah
Part	i té ga	ee teh kar
Pay	pa wa ke	paugh oar ke
Please	kó nya	ko gnee
Prepare	i ma di a	ee mar dee ah
Promise	ku ra gbí la	ku lae bih la
Protect	ku ma fé ra	kung mar feh lae
Quarrel	kó ri	qua dee
Receive	a gbá bú lo	ah bong boo loh
Recollect	a sá ku ro	ah song kung dong
Rob	a ga (?)	ah kar gar
Run	bú le ka	boo lee keh
Sail	wu fi la se ra	woo fee lah seh lae
Say	fing ro	fing dong
Sell	i ga	ee kar
See	a je	ah enjae
Sing	ro ng gbá	dong hhum boh
Speak	i fo	ee for
Stab	a ng sá me a	ah ung sor me ah
Stop	i sá	ee sor
Swear	a bú lo ke	ah boo loh keh
Take	i gbi	ee bee
Talk	di a bú	dhe am boo
Tell	i fo	ee for
Tear	i te j	ee teh
Think	i ku ro ki le ma	ee kung dong kee lee mar
Touch	i ma	ee mar
Tremble	a ma ni sa ng bá	ah mar gnee sam bah
Trust	i sa la	ee sar rah
Understand	na sá	nah sor
Wake	ea ku yé	ea kung nay
Walk	i tá ea	ee ta eah
Watch	i ma kí ke	ee mar kee keh
Want	ng lu lo a la	hhum woo loh a lah
Weigh	i mu su ma	ee mu su mar
Wish	i wó lo	ee woh loh
Work	sá ke	sor keh

The foregoing vocabulary is of the "Vahie" or Vei language, which extends over the following countries:—Cape Mount, Soungrie, Marma, and Gallinas, on the sea coast, and several interior countries. The variety of African languages is so frequently met with, that they may be more properly termed dialects, as the following may prove:—

Vahie.	Courroo.	Kroo.	Fish.
1 Dondo	goonoo	doo	doo
2 Feelah	tierla	song	song
3 Sacpah	tarlee	tah	tah
4 Narnee	teenar	neah	eh
5 Sooloh	noono	moo	d'moo
6 Soo dondo	dia goonoo	moomadoo	neeroo
7 Soo feelah	dia tierla	moomasong	mesoong
8 Soo sacpah	dia tarlee	mumatah	biah biah
9 Soo narnee	dia teenar	munia sussahdoo	chieeroo
10 Tang	zehiar	pouah	poh

Thus the above characters might be arranged into a general African written character.

In concluding, I hope the missionaries or others may follow up what has been thus commenced, as, from the opposite nature of the duties of a naval officer, I could neither spare time, nor hope for the opportunity, of faithfully arranging a grammar or making translations.

Notes on the Vei Language and Alphabet.

By E. NORRIS, Esq.

THOSE who have occupied themselves with investigating the languages of Africa may have heard that an account reached England last year of the discovery, by Lieut. Forbes, of a written character in use by the Vei nation in the interior of Africa, and of the consequent expedition undertaken by the Rev. S. W. Koelle, a German gentleman attached to the Church Missionary Society, and especially connected with the language department, to investigate the matter in the country where the language was spoken and written, some 300 or 400 miles E. of Sierra Leone. Not long after this, the foregoing memoir of Lieut. Forbes reached England, and was read at an evening meeting of the Royal Geographical Society. In the month of September the Church Missionary Society published an interesting narrative of the journey of Mr. Koelle, and of the complete success of his enterprise, together with translations of three manuscripts which he had brought with him from the Vei country. The narrative is probably in the hands of all who are interested in the subject, and it is consequently unnecessary to allude to it any further than to express admiration of the courage and intelligence with which the expedition was carried

out, and of the unpretending way in which it is narrated. The three manuscripts were placed in my hands by the liberality of the Church Missionary Society and the kindness of the Rev. H. Venn, the zealous and able secretary, and I have endeavoured from time to time, at leisure hours, to acquire an insight into the language. It seemed that now, for the first time, we had an opportunity of becoming acquainted with the less obvious peculiarities of a negro tongue; every writing in a negro language which had been hitherto within the reach of philologers being either the production of foreigners, or of natives who had been so long under foreign instruction that they may fairly be supposed to have lost something of the original purity of their own languages—to their great advantage, no doubt, but not so much to our purpose. In all cases too we had only translations, and these are unfitted to convey the idiom of a language. The manuscripts in my hands are clearly free from these defects: they are originals, the production of natives unacquainted, or slightly acquainted with European languages, and two of them at least are decidedly unsophisticated. Some of the results of my examination form the subject of these notes. I am sorry to confess that I have not been very successful in getting at the peculiarities of the language. The manuscripts are written without any division between words or sentences; and African languages consisting generally of short words, much encumbered, as *we* should say, with little particles, of which the meaning is not obvious to us, and which particles are now and then really nouns and verbs of importance, there is a continual risk of confounding them with these nouns and verbs, which I fear I have not always escaped. Added to this is the laxity of the translation, my greatest obstacle. I ought to have been prepared for this, for it was clearly impossible that Mr. Koelle should take a long journey in the exhausting climate of Africa, learn a new language and copious character, and translate a hundred and fifty pages into English, all in the interval of a few weeks. He states that he accomplished his task by the aid of some natives who understood English; and there can be no doubt that the books were read and translated roughly into some dialect intelligible to Mr. Koelle, who gave it the English dress in which he sent it home. This will readily account for the laxity we find: the native readers would translate orally what they could easily render, make explanatory comments when they could not find words for short elliptic passages, and skip over what they found too difficult: thus we find whole passages omitted, and short sentences expanded into long ones; names of persons and places set down where the original merely gives a pronoun, and the meaning frequently stated in terms differing wholly from those given by the author. Occasionally I can find no meaning whatever in the original, more particularly in the manuscript

marked D, an odd kind of moral or religious treatise, a mixture of native Negro ideas with some Mohammedan teaching. Notwithstanding this I am still under the greatest obligations to the translation, without which I could not have advanced a step. I have also been aided in the investigation by a slight acquaintance with the rudiments of the Mandingo, a cognate language with the Vei; by a vocabulary of sixty or seventy words in vol. 38 of Silliman's *Journal*, and recently by Lieut. Forbes's vocabulary, which has been often found valuable as a corroboration or correction of former conjectures. With all these aids it is with great diffidence that the following imperfect notes on the language are hazarded, as I am more than any one aware of the insufficiency of my investigation; in most instances, however, each grammatical statement will be accompanied by a passage in proof from the manuscripts:* this would have been done in all cases, and more copiously, had I not unfortunately mislaid the sheet containing my references, at an advanced period of the research, and I fear I must therefore sometimes make a statement without sufficient proof. The leisure which I have been able to devote to the subject has been very short and frequently interrupted. I am conscious that the work is but half done; and I cannot now read a page without finding some error in former readings.

The alphabet consists of nearly two hundred characters, each representing a syllable, which is usually composed of a consonant and vowel, as *ta, be, si, &c.*; sometimes a nasal closes the syllable, as *bang, deng, sung*, and a few are simple vowels. The plate accompanying will show the transcription adopted in this paper, as well as those given by Lieut. Forbes and the Rev. Mr. Koelle. I have written the syllables of Lieut. Forbes without alteration, but have taken the liberty to change the *dsha, dshe, dshi, &c.*, of Mr. Koelle, to the simple *ja, je, ji*. The first division of each column in the plate contains the character as most frequently made in the manuscripts, which may be called the normal form; the second contains the varieties met with, in which those are not included which are produced by turning a letter upside down, sideways, or backwards, a practice very common with certain characters. The three remaining divisions contain the transcriptions of Mr. Koelle and Lieut. Forbes, and the one adopted here. When the character given by Lieut. Forbes differs much from that in the manuscripts, it is placed in the second division, as well as a few which are found in his alphabet only; these are marked with a little cross, and some of them, possibly, are mis-

* The originals are referred to by the letters A, C, and D, and by the number of the line. If these MSS. should ever be published, this will enable a future investigator to test my results; and if not, there is no doubt the Church Missionary Society will afford ready access to persons desirous of consulting the MSS.

takes ; but in one or two cases they give the sound of a character found in the manuscripts and not included in Mr. Koelle's list. In the fourth division there are several blanks, many characters being omitted by Lieut. Forbes as unknown to him ; in fact, at least fifty of the characters are very rarely used, and I have found them only in proper names. A few at the end, which have no transcription, are not given by either Koelle or Forbes, but are found in the manuscripts without a clue to their sound. It has been already said that the pronunciation of two or three such characters may be inferred from Lieut. Forbes's alphabet, and one is given from conjecture : with the addition of *ma* it evidently signifies "a shirt," and the word for "shirt" is given by Lieut. Forbes as *doungma* ; in one instance, too, the character is substituted for the final syllable of *Mandu*, the name of a town ; I have therefore called it *du*, and placed it accordingly.

There are two characters in the Syllabarium which have the very different sounds of *hà* and *na*. In the plate one of them is the same form as the other turned upside down. As many of the characters are found in every position, I am inclined to think that these characters are only one, and that they represent the Semitic *y*, an additional trace of a (so-called) Semitic element found in an African language. Like the *ain* it is an obscure sound, little heard by strangers, and confounded by them with *ng*, or *h*. It is thus that in Hebrew grammars we find the technical names of the conjugations which have *y* in the original, written in Roman characters, with *h* ; as *Pihel* and *Puhal*, often pronounced *Pingel* and *Pungal* ; so, in Vei, although the character is written, whenever we have any means of testing the pronunciation we find it little sounded. Thus the word "four" is given as *nani* in our vocabularies, and is *nani* in Mandingo ; in our manuscripts we have sometimes *nani*, sometimes *nanani* or *nahani* : the proper names in which the character is written in the manuscripts are transcribed by Koelle without it, as *Fa Bofè*, p. 502, *Fa Tàce*, p. 605 ; in both of these we find *Fana* in the manuscript ; we have *Mana* written *Manana* again and again in manuscript A. In the other characters having the same element the same fact is found ; thus *mo-nu*, men, is occasionally written *mononu*. And the name which Koelle reads *Barakamu*, is made by the syllables *Bàlakamono*.

The sound of a word is not always to be accurately known from that of its component syllables : the word "hot," for instance, is written by Lieut. Forbes with characters which he reads *ah pah de ah*, while he reads the whole word *ahpandeah* ; he writes "an ear," *to-loh*, and reads it *toroh*. The same irregularity is found in Mr. Koelle's translation : the name of the inventor of the alphabet he reads *Doalu*, while he reads the letters of his name *dshi*

a lu,* or *dshi a du*; the name of *Surufure* he spells *So lu fo lü*, or *So du fo lü*; *Jara kala*, in his alphabet is *Ja la kà na la*, or *Ja da kà na la*, and so on with many of the names in the manuscripts. In all this we find nothing more than what is common in our own language, and therefore the orthography followed in this paper is as likely to represent the sound of the language as either of the others, and it certainly has the advantage of a distinct representation for every different character. It is probable that several characters are used for the same sound, though the meaning is different where a different character is used. The similarity of sound is inferred from the circumstance that one character is sometimes substituted for another, though there may be slight differences not readily appreciable by strangers; and, in fact, something like the Chinese tones has been suspected by persons who have heard the pronunciation of certain Negro tribes. The consonants *d*, *r*, and *l*, seem to be distinguishable with difficulty, and the same word is often written with either; *da* and *la* are perpetually confounded.

I now proceed to the grammar, observing first, that the collocation of Dr. Latham, who, in his able paper on the African languages, published in the Report of the British Association for 1847, places the Vei among the cognates of the Mandingo, is perfectly correct. The noun, as in other Negro languages, has no inflection; all its modifications appear to be made by placing particles after it; the plural takes *nu* (the Mandingo *lu*), as *mo*, a person, *mo-nu*, persons; *musu*, a woman, *musu-nu*, women. Other particles generally follow *nu*, as *mo-nu-ye*, to men; *musu-nu-ye*, to women.

The nominative case very frequently receives the particle *wa*, or *wá*, when it is the subject of a verb; examples are: *mo-nu-wá moya-nu fá*, D. 542, the men killed the men; *Gotolu-wá Jala Büdu bi*, D. 536, Goturu seized Jarabulo; *Gotolu-wá Gbako fá*, D. 542, Goturu killed Baku; *Wannya-cele-wá a fö Bilang-la*, A. 23, Wonyawere he said to Bilang. The particle *ye* is used precisely in a similar way in the Mandingo language; Macbrair gives several examples, and he believes the particle to be merely separative, placed to distinguish the nominative from the governed words which follow. This is not unlikely, but the particle is certainly used in Vei where no governed word follows, though I cannot cite any instance. *Wa* is once used in a dative, *a-wa-ye*, D. 695, to her. In a phrase of frequent occurrence in one

* *Dish*, in the alphabet given in the plate accompanying the Narrative; but this must be an error of the lithographer for "*dahi*," a sound which we represent by *jí*, and Lieut. Forbes by *jee*. This particular character Lieut. Forbes makes *dua*, in which we follow him.

of the manuscripts, *ye* is used as in Mandingo; it is *gbolu-ye ro*, the book says.

I find something exceedingly like an accusative case, which, however, I have some difficulty in admitting the existence of in a Negro tongue, and yet the character which forms it is rarely used in any other way; the character, too, is unlike the others, being made of four dots in a perpendicular line, as though intended to be separate; its sound is *me*. It is of frequent use, as *a ni patáwa roro-me bila*, D. 207, he must dollar one take; *anu la maja-me gbi kéle*, A. 19, they did the gentlemen all call.* Still more frequently, perhaps, *me* is omitted; but it appears a characteristic of African languages to omit the particles of case, number, time, &c., when the passage is plain without them.

The genitive is sometimes made by simple apposition, as *Sau bólu*, A. 15, Sau's hand; *Rora fa*, c. 45, Rora's father; *Tuto ja mo-nu*, c. 140, people of Tatu's town; *Rora mamá gbálo mo-nu la bá fá*, c. 123, Rora's grandmother's town's-people did a goat kill; but more frequently by the particle *la*, or *da*: as *a fa-la Polu mo*, c. 195, his father's white man; *mangja-da dengna*, c. 422, king's daughter. I have once found *wa*, as *nyomo-wa deng*, c. 115, brother's son.

Other cases are made by *la*, or *ye*, to; *fe*, after; *lo*, in, or into, &c., as *kai-ye*, D. 202, to a man; *i ta fo Gotolu-ye*, D. 499, you go tell to Goturu; *i a tála kalu-la*, D. 422, you carry it to the moon; *u sá a-fe*, A. 200, you send after him; *mowá mo sáwa i-fe*, A. 36, we a man send after you; *a bólu-lo*, c. 17, in his hand; *ariyane-lo*, D. 2, into heaven; *ja-lo fera*, D. 68, look into the face.

It is possible that the particle *ni* may be a real preposition, meaning at, or to; it seems to occur in such phrases as *deng mu ulu ni Vai*, c. 47, a son who was born in Vei; *na ni Jundu*, c. 14, came to Jundu; *Rora be Date ta ni Túto ja*, c. 144, Rora and Date went to Tatu's town. I am rather inclined to think *ni* a termination to the preceding verb, making *uhni*, *nani*, *tani*, though I do not see its meaning yet. I do not like to admit a preposition; *be* may be considered as a conjunction.

Adjectives appear like substantives, with hardly a shade of difference; and they follow the substantive. I find nothing like degrees of comparison.

Personal pronouns are *ng*, I; *i*, thou; *a*, he or she; *mowa* or *muwa*, we; *u*, ye; *anu*, they. These are Mandingo in the singular, but not in the plural. All these pronouns are constructed as nouns, with the same particles; as *a-wá mo sá*,

* For the better understanding of the meaning, I translate word for word, where there is any possibility of mistaking the respective values of the words.

d. 490, he sent a person; *u-wa je*, d. 217, ye see; *a ba be a fa*, c. 7, his mother and his father; *a bólu*, c. 15, her hand; *ng-la kura*, d. 72, my word; *i-la*, c. 301, to you; *a-ye*, c. 152, for him; *a-fe*, A. 200, after him. *Muca*, we, is divisible; as *mu na wa*, A. 83, we are come, for *muca na*. Perhaps *mu* is the original word; in some phrases "we" is expressed by *mu-nu*, as *mu ta nu*, c. 90, we go; see also A. 56, 63; and *mu* in one case stands alone; *ni mu ma kóng gbá-me dong*, d. 690, must we not tree-plums eat. Once I find *umu*, d. 546, meaning we, in the sense of the inclusive we of the Polynesian, Manchu, and Malay languages, "you and I." When *I* or *thou* is made plural by the addition of a third person, the plural pronouns are generally used instead of the singular, as, *mu be Sau*, A. 123, I and Sau (literally, we and Sau); *u be mo*, c. 518, thou and the man (literally, you and the man), as though the speaker thought of himself or of the person he addressed, and of the third person together as a plural, and then added the name which made up the plural. I do not remember this in any other language, but it is very general in Vei, and may perhaps be found in other African languages.

The possessive pronouns are obvious from the examples given of the personals; but *lalo* is used occasionally in the genitive instead of *la* only; *u ng-lalo kura bila*, d. 220, you my word keep. See d. 266, 231.

The demonstrative pronouns are *ke*, this, and *u*, that; and in confirmation of the opinion that the conjunction "that" is a pronoun, we find *ke* used in the same way, *a ro ke a ko-nyama jiri*, d. 96, he says that he made evil. See also l. 217. Several instances of this construction were collected, but they are mislaid. I think *nyinya* means "this," but I am not yet sure.

The relative is *mu*, and it is placed immediately after the antecedent, as, *a ko bera mu je*, c. 1, the good which he saw (literally, he thing good which saw); *jon mu a fála*, A. 14, the slave who is dead (slave who he is dead); *Gotolu a mo mu sá*, d. 514, the man whom Goturu sent (G. he man who sent); it is sometimes placed before the sign of the plural, as *mo mu nu*, d. 245, the men who.

The interrogation is *Jo*; *jo kani ng-la kura*, d. 72, who broke my word?

The verbs are simple, and I have as yet discovered no irregularities. When the time is clear from the context no mark of tense is used, and nothing more is required than to put the verb in its simple state after the nominative, as, *a ta*, c. 1, he went; *anu ta*, c. 42, they went; *a fo musuya-ye*, c. 177, he said to the woman; *mo-wá mo sá*, A. 35, we send a man; *u-wa je*, d. 217, you see; if the nominative is not a pronoun, the pronoun is often added, as *Sau a fála*, A. 9, Sau he died. When the past time is expressed, it is done by adding *da* or *la*; as *a da tiya fela fá a-ye*,

c. 152, she did fowls two kill for him; 'a *la a gbóyá gbi kéle*, c. 159, he did his family all call. The *la* or *da* appears to follow some verbs with the same meaning, as *ng jang-la i-la*, c. 301, I have spoken to you; *a jang-da Bálakamono-la*, c. 56, he spoke to Barakamu; *anu-wa anu bi-la*, D. 534, they took them; *a báwa-la bi-la*, c. 209, he took a sheep; *Bílang dau-la*, A. 26, Bilang assented; but as *la* is frequently a verb, a preposition, or a termination to a noun, I am uncertain as to this: there may be a modification of meaning in this additional syllable, as *fá* is to kill, and *fála*, to die; *ji-la*, to show, may be the causative of *ji*, to see, but this would be a reversal of the effect of *la* in *fála*. The future of obligation is *ní*; as, *i ní ta*, c. 371, you must go; *u ní a mí*, A. 256, you must drink it; *i ní mo sá*, c. 48, you must send a man; *anu ní kura gbang*, A. 191, they must say the word. The ordinary future is *be*, as in Mandingo; *ng be jáng*, c. 180, I shall speak; *ng be i fá*, c. 350, I shall kill you. I think *be* is the verb substantive.

Other modifications of time or mood are made by other particles, as *nu*, *ta*, *ní*, *ma*, &c., but they have not yet been examined carefully; *ma* before a verb denotes a negative, as, *a ma ng riya*, c. 440, she did not love me; *a ma musu to a bólu-lo*, c. 16, she did not leave a woman in his hand. *Wele* and *bele* also are negatives. The first probably means cannot; *anu wele ta*, D. 491, they cannot go.

The infinitive mood seems to end sometimes in *na*; as, *i ní mo sá a bina*, c. 48, you must man send, him to fetch; *u ta fá bina*, A. 25, you go the corpse to fetch. The Mandingo equivalent form is *la*, but the infinitive is often found without any addition, as, *i ta a tusa*, D. 509, you go and ask him; *i ta fo Gotolu-ye*, D. 499, you go tell Goturu. In some cases the particle *nu* seems to designate the potential mood, like *no* in Mandingo, as in the sentence *ng bele ta nu*, c. 138, I cannot go (I not go can), but I have found *nu* in many cases when I cannot seize its meaning.

There are several syllables of frequent occurrence joined to nouns and verbs, which I cannot determine. We find, for instance, *musuma* and *musuya* a woman, as well as *musu*: also *kaiya* and *kaima* a man, as well as *kai*; *deng*, *dengma*, and *dengna* is a son or daughter; *báwa* and *báwala* a sheep. In verbs we find *kí* and *kiya* to sleep; *ké* and *kéya* to obtain; *yarahe* and *yarawake* to laugh; *riyá* and *riyáni* to love, and many others: these must be left to more extended comparison and closer investigation.

In adverbs and conjunctions my stock is very small. *Amu* is a word of constant use, meaning *and*; it is employed to connect sentences; *hi* connects words, but is more sparingly used; *hera* is, I think, *but*, and *akomu*, or *komu*, therefore; *koni*, or *koninya*, is *if*; *Gbówa* and *gbó* is, *off*, or *away*, and it certainly has a verbal signi-

fication, as in the elliptical phrase, "away with it." Examples are *ng gbówa Gbóngbái*, A. 38, I (went) from Gbombai; *a-wá gbówa tala*, A. 155, he (fetches) away a mat; *a ba gbówa Jonlu*, c. 6, his mother (came) from Jondu; *a mo-nu gbó*, c. 112, he (sent) away the men. *Gbéng* or *gbáng* at the end of a sentence is, I think, "when," as, *ng kényá Búdakólo-wa gbéng*, A. 43, when I reached Bandakoro; but I have yet hardly touched this part of the investigation.

The only portion of the Syntax I can see through is very simple. The general rule seems to be to put the nominative first, followed by the accusative, if any, and then the verb; if there be a noun or pronoun in the sentence connected with a preposition, it follows the verb. Examples are *Jala ro*, D. 491, Jara said; *a-wa mo sá*, D. 490, he sent a man; *a da fò a-ye*, c. 139, he did say to him; *a la hura gbóng Táto-ye*, c. 146, he did a word say to Tatu. The negative precedes the verb; *i ma lau*, D. 24, you do not assent; *anu ma a deng Manana tála*, A. 194, they did not meet his son Mana. Adverbs come after the verb: *Sari-wá mo sá niye Gotolu-bála*, D. 498, Sandi sent a man here to Goturu. The infinitive comes after the verb: *i ta a tusa*, D. 509, you go to ask him; *a-wá mo sá Gáno anu bina*, D. 490, he sent a man to Gano to fetch them. Names of places are generally without prepositions; *anu-wá ta Gáno*, D. 489, they went to Gano; *anu na fá la Belenonyi*, c. 108, they came to bring the corpse to Belewoi. Sentences are frequently closed by the syllable *u*, and more completely by *he*, which means "hear." Sometimes both are used, which would be, "you hear." This is probably the original meaning, though it seems now lost, as I find it at the close of an address to a single person, as, *a ro, na bang jang-la, i ta-wá, u he*, c. 306, he said, I have finished my speech, now go.

The above are the scanty notes on the language that I have been able to get together. In addition to the points of resemblance with the Mandingo language incidentally given in them, it may be found interesting to give a brief list of words, showing the glossarial connection of the two languages, and most of them will be taken from Lieutenant Forbes's vocabulary, given above. But in order to use his vocabulary with effect, I must first point out some prevailing errors in it, without meaning in the smallest degree to detract from the merit of that officer, whose discovery is highly creditable to him, and who is entitled to the gratitude of the philologist for the patience with which he has obtained so many vocables, and on the whole with so few errors. It may be believed that most vocabularies so obtained would be found more erroneous if we had the same means of testing them; and, after all, it is not sure that in assuming an error I may not be displaying my own insufficient knowledge. I think Lieutenant

Forbes's informant often defined words instead of translating them; "air" is made, "wind comes to you;" "fever" is, "his skin is hot;" "thirsty," "I want to drink water;" "invite," "you call to the house;" "free," "son of a chief," or "little chief;" "less" is, "thing not big." The adjectives are preceded by *a*, meaning, I think, "he is," or "it is." *Hhumbah* is my mother, and, I think, *nah moosu*, my wife; *nah kah*, my husband; *na ding*, my son. The verbs are generally preceded by some one or two of the pronouns *ng*, *i*, *a*, *I*, *thou*, *he*: we thus find, you buy it, I love you, you have opened, he stabs me, instead of the simple verb. The pronouns are more difficult to obtain from a man unused to grammatical distinctions; and we thus find *kaiemeh*, a person, and *mohmehnoo*, men, both in what may be the accusative case, for "he" and "they." The possessives are made by adding *tahmun* (*támu*) to the primitives, and *tahmun* (belonging) is used alone for "my." Most of the other pronominals I fail in recognizing, nor do I know what they ought to be. Notwithstanding these errors, which are easily corrected, I have found much assistance from Lieutenant Forbes's vocabulary, and I must repeat, that in hazarding these strictures, I do it with diffidence, having mostly no other guide than conjecture. There are many points in the language through which I do not see my way, and I cannot explain any thing beyond the simplest sentences without the aid of the translation.

The following list is very short, but it appeared unnecessary to take more than a few words, and to select such as show the connection with Mandingo and Bambarra most readily, with few organic changes. The verbs from Forbes's vocabulary are given without the appended pronouns, and all his words are spelled as in the MSS. when I have been able to find them. Those not found are marked with a star. The Bambarra words are marked B.

Vei.		Mandingo, &c.
kéle	to call	akilli
na	to come	na
dang *	to count	adang B
mi	to drink	imi B
dong	to eat	adum B
dóng	to enter	dung
ta	to go	ta
fá	to kill	fa
sina *	to lend	assingna
fáni	to tell lies	fonio
kóri	to quarrel	kiri B
bóri	to run	buri
ji	to see	eaji
dari	to spit	dajio
fo	to tell	fo



Vei.		Mandingo, &c.
ma *	to touch	ma
ulu	to be born	awulu
sulu	a root	sulo
tamba *	a spear	tamba
ula *	a dog	wulo
kó	salt	ko
jale *	red	zioli B
sang	a year	sang B
kalo	a month	kalo B
saama	morning	somo
suro	night	suto
tele	sun	tili
jang	long	jang
mo	person	mo
kai	man	kea
musu	woman	muso
bólu	hand	bulo
minyē	sword	benye
ariyane	heaven	ariyena
jahanama	hell	jahaniba

It would be easy to extend this list of similar words to many times its length; but a false idea of the resemblance of the languages would be conveyed without the statement that the number of words in Vei having no apparent connection with the Mandingo dialects is larger than that of the words which are alike.

A fac-simile of a page of one of the MSS. is added as a specimen of the character and language: a page has been selected, of which the printed translation is the closest I have been able to find. The transcription is divided into words, and accompanied by an interlinear version, where I could ascertain the meaning of the words.

gbówa; anu kiyá Morobáwá táng gbé, amu anu sáwa Báisa
 they sleep at Little Cape Mount ten times, and they go to Bassa
 kilafé, anu ta awa kaka, amu anu káyá Bangjóju ja, amu a mo sá
 back? they go on? long-time, and they reach Bayoju's town, and he man send
 Rora fa bála, a ro, yá yá, deng mu ulu ni Vai ke, a na niye, a
 Rora's father to, he say, O, O, son who born in? Vei this, he come here, he
 ro i ni mo sá a bina kilafé; gbolu-ye ro, mo mu ta ke awa
 say you must man send him to fetch back; book say, man who go this he
 tâng Bála Kamóno; a Rora fa tála.
 is named Bara Kamu; he Rora's father met.

The translation of Mr. Koelle is as follows:—

"On his journey he slept at Little Cape Mount ten times; then he took the Basa path and walked a long time, till he reached the place of Bayodshu. Then they sent a message by Bara Kamu, to Rora's

father, saying, the son whom you begat in Vei has come here, therefore send hither to fetch him. Bara Kamu met Rora's father."

With respect to the question of the fitness of this character for the language in which it is adopted, the rapid way in which it has spread through the country where it was invented, seems to be decisive. Within a very few years after its first promulgation, we find it written and read by large numbers of all ages, in as great a proportion perhaps as readers and writers are found in most countries of Europe, and taught in regular schools until war broke up the establishments and dispersed the teachers. Even now, in Bandakoro, the chief Vei town, "all the grown up people of the male sex are more or less able to read and to write."* And this, be it observed, was wholly uninfluenced by European teaching, while all our endeavours have barely sufficed to induce a single tribe to adopt the Roman alphabet generally. We may, therefore, suppose that a syllabic alphabet is more suited to the ability, or, it may be, caprice of a negro, than our analytic alphabets. Again, all people receive inventions of their own with greater favour than foreign importations: the Armenians are said to have used for ages the Greek and Syriac alphabets, and they produced with them little, if anything, which has come down to us; but in the fifth century, when Mesrop invented what we think his clumsy alphabet, they immediately began to write, and they produced in the following centuries a respectable literature, original and translated, which might vie in quantity with that of most European nations of the same period. The invention of the Arabic alphabet, in the sixth century, seems to have had the same result among the Arabs. The Cherokees, thirty years ago, invented a syllabarium; they immediately began writing and printing it, and they even produced a good newspaper: the development of this germ of civilization, the first of the kind ever displayed by a native American tribe, was checked, and probably destroyed, by the barbarian policy of the local government of Georgia.

Irrespective of these considerations it may admit of a question whether a syllabarium may not be better suited than our alphabets, to a language of so simple a syllabic structure as the Vei, the number of whose sounds is so limited; and, moreover, when many words in a language have the same sound with a different meaning, it must be difficult to understand a system of writing which conveys the sound only. Many nations do make a variation in spelling for such cases: thus we write sent, cent, and scent; pare, pear, and pair. The French too write parler, parlé, parlais, parlait, parlaient; in each case with a different meaning, but the same sound; and there can be no doubt that such non-phonetic

* Narrative, p. 25.

variations add much to the facility of reading. In the Vei language these differences of meaning with the same sound appear to be very much more numerous than in English or French, and we hardly see how the difficulty is to be got over without some such system as that in question, unless we would have recourse to such a plan as is adopted from necessity in this paper, which is certainly more difficult to be learned by a person ignorant of both systems. It is true that the number of characters is large, but more than a quarter of them are of rare occurrence, being only used for Names, probably for the sake of distinction, like our capital letters, and these might be retrenched by the use of a larger character for such a purpose. It must be remembered too that when the syllabarium is learned the art of reading is acquired, while with us the learning of the alphabet is the smallest part of the work, and children know their alphabet perfectly a long time before they are able to read. It would be too much to recommend the casting of types, but with the facilities offered by lithography, it might be worth while to try how far the translation and dissemination of a few tracts in a simple style may be available to awake a spirit of inquiry which may ultimately result in the civilization of the negro.

To judge from the structure of the language, the same character would be equally available for the Bambarra, Mandingo, and Susu nations, with populations of several millions, spread over a large surface of Africa.

VII.—*Observations on the Geography of Texas.* By WILLIAM BOLLAERT, Esq., F.R.G.S.

[Read January 14, 1850.]

TEXAS, once a province of Mexico, was wrested from it a few years since by a handful of American farmers, who in an incredibly short period erected their conquest into an independent Republic, which was recognized as such by the United States and by several European governments, and but very lately became annexed to America as one of the Federal States of the Union.

Its coast boundary begins at the Sabine River, runs along the Gulf of Mexico to the Rio Grande del Norte, a distance of 400 miles; thence up said stream to its source, which has recently been laid down in about 40° N., 109° 30' W., running N. on this meridian to 42° N., and eastward along that parallel to 107° 30' W., then S. on that meridian to the Arkansas River; thence down the Arkansas to 100° W.; thence by Red River to 94° W.; thence by a straight line south to the Sabine in lat. 32° N., and from thence to its mouth.

As early as 1528, Narvaez, one of the lieutenants of Cortez,
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traversed the whole of Mexico, and crossing the Rio Grande, discovered Texas.

The course of the Texan rivers, running nearly parallel to each other, indicate the general surface of the country to be an inclined plane, sloping towards the S.E.

The surface of the country presents three distinct natural aspects, viz., the level, principally of alluvion of different degrees of richness; the undulating, of diluvial character and other deposits; the mountainous, of secondary and primitive formations.

The first appearance of the coast of Texas is unfavourable; if approached by sea a low sandy beach, backed by wet and level prairies, is seen.

The long and narrow islets which form the coast appear to have been bars of sand and alluvial deposit; these have gradually risen above the level of the sea, have been kept mainly in their position by the S.E. currents, aided by the deposition of oyster and other shells, drift wood and sea weed.

To illustrate this, it may be mentioned that the long peninsula which terminates at Decrow's Point, forming a barrier against the sea, and sheltering the Bay of Matagorda, is marked in an old Spanish chart *as a chain of islands*.

In an old survey of Galveston Bay published in 1809, the locality now known as "Pelican Island," is not laid down, nor is there any indication of shoals; thus, if the survey be entitled to credit, Pelican Island is of very recent formation.

The pretty constant succession of S.E. winds which bank up the sand and prevent the alluvion of the rivers from blending freely with the waters of the Gulf, constitutes another agent of accumulation.

The islets and bars of Texas are gradually encroaching upon the sea, and thus contracting the bed of the Mexican Gulf.

In 1814 we became acquainted with a mass of meteoric iron which was found about the head waters of the Brazos.*

Galveston Island—the town is in lat. $29^{\circ} 16'$ N., long. $94^{\circ} 56'$ W., var. $7^{\circ} 50'$ E.—is 30 miles long by 2 in breadth, and has an average height above the Gulf of 10 feet. During spring tides part of it is subject to inundation. Its vegetation is chiefly confined to rough grasses, with here and there a few small trees; its ponds and inlets the abode of alligators. A thin surface soil covers it, then commence recent alluvial matters, containing much sand brought down by the rivers from the upper country.

A very low tide gave me the opportunity of observing underneath the sand of the shore, a body of stiff plastic sandy stuff, on which oyster beds of very great extent are formed, and in some places thick layers of broken shells of oyster, clam, conque, &c.

* A specimen of which is in the British Museum.

Sandy ridges run along the sea-shore of the island (as well as along other parts of the coast), and in the rear of these often may be observed a series of holes running parallel to the ridges, which in the rainy season are filled with fresh water, but when there is an overflow of water from the Gulf, these holes get filled with sea-water, and may be termed natural salt-pans; the long summer heats evaporate the water, and thus large quantities of salt are annually formed (at some distance from the coast in 27° N. and about 98° W. are some large salt lakes in the low prairie country, which may date their origin from the above-mentioned system of things).

On the Gulf shore of the island in particular is found much drift wood, and here and there, as well as on other parts of the coast, masses of asphaltum embedded in the plastic sandy stuff already adverted to. (This species of mineral pitch is said to have been met with on the San Bernard River 80 to 100 miles from the coast, and in a heated state.)

Occasionally small rounded pieces of white pumice stone are met with upon the shores; but as we know of no volcanoes in this part of America, I will not hazard an opinion as from where such may have come.

I now propose giving such sections as I was able to make out.

SECTION I.—*From Galveston to Austin*, on the Colorado, traversing in a N.W. direction, reserving for a tabular form, distances, approximate elevations above the sea, and direction by compass.

Crossing to Virginia Point, which is on the main, we come upon low prairie land, but wherever a creek or river traverses the country, then the soil becomes richer in what are called the "bottoms," or land contiguous to these rivers and creeks; and trees, some of large growth, are met with; amongst others the cedar, live oak, cotton-wood, and the highly scented magnolia.

Houston being attained is found to be 70 feet above the level of the sea, and on digging a well to 70 feet in depth, there was presented a sandy surface soil, followed by plastic sand, which latter answers for the manufacture of bricks.

Proceeding onwards to the Brazos River, rich "bottom" land is arrived at, with a rise now of 150 feet above the sea, and on the opposite side is situated *San Felipe de Austin*. The river runs between steep banks. This spot is rendered interesting by the occurrence of fossil remains found in the bed of the river.

On my visit to this place I found the settlement deserted, high grass growing around the habitations, and was much disappointed in not being able to examine a collection of fossil bones said to be here, and found in 1837; the vertebræ and leg bones said to

be very large. I however subsequently obtained a specimen of the teeth, and was assured that large quantities of such teeth and bones had been discovered, as well as a fossil horn 8 feet in length, and 3 feet in circumference in the thickest part. The fossil tooth which came into my possession appears to be of the *Mastodon*. Silicified wood has been found about here.

Crossing the prairie to the San Bernard a few small silicious pebbles are met with, and in the bed of the stream I more than once searched without success for what General Almonte describes to have seen in 1834, viz., a bed of heated bitumen. I have, however, no doubt of the existence of the substance in this locality.

We enter now the rich river lands of the Colorado, and here again have been found large fossil horns. Having crossed the river to Columbus, an elevation of 250 feet is attained, the surface soil rather sandy, but still most propitious to vegetation; cotton, tobacco, Indian corn growing luxuriantly; the castor oil plant, stramonium, wild sun flower, &c., in great profusion. Here is a bend of the river 16 miles round, but only 900 yards across the bend, with a fall of water at times of 17 feet.

This section now goes up the Colorado to *Rutaville*, over undulating and rising land, and we now come upon what the settlers call "rock," which is a sandstone indurated with calcareous matter, and mixed up with other tertiary strata. *La Grange* is on the river, and where high bluffs commence to be seen, one below Buckner's Creek is 400 feet above the river.

To the West of Buckner's Creek Mr. Wood found the remains of a fossil tree, the circumference about 18 feet. Mr. Wood places this "mammoth vegetable production" amongst the fir tribe. It is now composed of a gritty ferruginous sandstone—not decorticated, and retaining every familiar appearance of a very ancient native of the American forests. This fossil tree was imbedded in,

1. Vegetable soil, composed of clayey alluvion, containing myriads of fresh water shells.

2. Sand, clay, and conglomerate.

3. Soapstone, beds of gravel, and clay alternately.

Mr. Wood also found near this a cave with pendant stalactites, and pursuing his investigations, he observes that "in some of the prairies there are small dividing ridges, which run at parallel distances, as if thrown up by art, in which is found a variety of glassy actinolite." And he further states that he found large blocks of "rock" imbedded horizontally in the strata.

I crossed the Colorado at *La Grange*, going up the right bank of the river through a most luxuriant country, and somewhat tropical; very hot during the day, but cool at nights. Cotton and Indian corn in abundance, and the cattle and sheep looked thriving.

Ranges of hills were passed from 200 to 300 feet above the prairies, composed on the surface of gravel and rounded silicious pebbles, and underneath strata of indurated sand containing much oxide of iron, and strong enough for building purposes; this is the sandstone of this part of the country.

Heavy rains came on, causing "freshets" in the rivers, filling up the creeks with "back-water," 40 to 50 feet deep. I saw much cedar and walnut in this section of country.

Bastrop is on the left bank of the Colorado, on high prairie at the foot of the Colorado hills: these are composed of silicious conglomerates and much indurated sand. Fossils of oyster, ammonite and other shells, are occasionally met with.

Two miles below Bastrop, and within 200 yards of the river, were discovered the remains of a species of the mammoth. The great mastodon is said to have no horns; but I have (so Mr. Wood says) nearly a perfect horn, $6\frac{1}{2}$ feet in length, 9 inches in diameter, or 27 inches in circumference: also part of a tooth, say one-third of it weighing 16 or 18 lbs., and about one-third of the lower-jaw or socket of the same weight," and Mr. Wood goes on to mention, "they exceed the size of the large bone of Kentucky."

Webber's Prairie.—In digging a well, a large fossil bone was extracted—"leg bone like a buffalo's in shape." And sinking another well, fossil shells of the mussel character were found, and sharks' teeth in the bed of the river.

Sixteen miles below Austin in the bed of the Colorado, Mr. Webber found "leg bones of some large animal," in consequence of the bank of the river having "caved in," or broken away. These bones were not preserved.

Here I saw a large ammonite nearly 2 feet in diameter, which had been brought from the San Gabriel river, 50 miles N., composed of a bluish calcareous matter; it had some small oyster-shells adhering to it, and I was informed that about the San Gabriel there were fossil shells like the mussel, conque, and clam species; also, that on Lettles River there were indications of silver ore.

At Webber's prairie I met with a Backwoodsman, who but lately had been with a party to explore the San Saba Valley (W.N.W. of Austin), and who had seen the ruined works of former mining operations, and from communications made to them by the Indians, there appeared no reason to doubt, that there were gold, silver, and lead in that region; as also in the valleys of Piedra Pinta, Llano, and Pidernales.

Austin, the capital of Texas. Having been much exposed previous to and during this journey, sleeping for weeks in the woods, and as the autumnal bilious and intermittent fevers were raging, I did not escape. Still between the "chills and fever," I

wandered about the country, and under no very favourable circumstances, being escorted by some friends who were well armed in consequence of the Comanches being in the vicinity marauding.

We were now in a hilly country, rising rapidly towards the west, composed of sandstone and calcareous rocks, in which traces of sulphur are found. In the sandstone were fossils of pecten and ostræa.

The "soft rock" (limestone) of Austin is easily quarried and indurates quickly, though by exposure to the air it cracks. Some fossil bones and ammonites have been found in it; likewise nodules of sulphuret of iron, and indications of common salt. I found no traces of coal.

Here I had an opportunity of examining some minerals from the San Saba Valley, viz., gold, sulphuret of iron, and copper in a quartz gangue.

This section of country would afford a new and interesting field for the zoologist and botanist.

Barton's Springs.—2 miles on the other side of the river from Austin, where the water rises and fills a natural basin 20 feet deep.

There are falls in the river about here, and 80 miles above Austin there is a fall of 300 to 400 feet.

Mount Bonnell is the highest peak amongst these hilly ranges, and about 700 feet above the river. Mr. Bonnell, who examined its summit, says that it is composed of "coral rock, oyster, and other shells, and the base of the hill abounds in ironstone."

Higher up the Colorado, commences a series of table lands or prairies, with good pastures, the streams well timbered, and country abounding in game.

40 miles above Austin is said to exist "a basin of rock" full of fish, with stalactites hanging from its edges, and asbestos, bones, fossil shells, and sea-eggs, found in its vicinity.

Honey Creek (above Austin).—An old forge was found, and the ground seemed to have been dug as if for gold washing, and the rock of the country of a hard silicious character.

I descended the Colorado to Columbus, being many days ere I reached it, owing to continual and severe attacks of fever.

SECTION II.—*From Columbus towards the West.*—The country is undulating, with clear trout streams, and abundance of game. On the Navidad is a chalybeate spring.

La Vaca.—Some wells 50 feet deep have been sunk through clay and indurated sand. Crossed the Big Hill range, which runs N. and S. through the prairies, and may have an elevation here of about 400 feet above the sea, composed of diluvial looking matters and sandstone; and from these hills are beautiful views of this part of the western country.

On another excursion to the west, I went from Houston to Richmond on the Brazos, where the strata are seen to be marly and conglomerate of silicious matters, on which fossil bones have been found.

I was lost for two days on the Big Hill prairies, where I had an opportunity of examining the surface soils, rich looking and black, reposing upon recent sandstone, forming beautifully undulating lands, where roam herds of mustangs or wild horses, and droves of wolves. The forests of Peccan trees yield a small delicious nut.

Gonzales, on the River Guadalupe.—The lands are very good, and fit for all agricultural purposes, although the surface soil is sandy, reposing on silicious conglomerates, in which selenite is found. Amongst other botanical novelties is a most abundant variety of capsicum, called *chiltipin*, about the size of a pea, green and red. Of birds, the cardinal in great numbers.

Twenty miles above this place great quantities of *geodes* filled with sand are found, from four inches to a foot in diameter, imbedded in a bluff of reddish loam. These when broken form useful articles of kitchen furniture, answering for basins, jars, &c.

In *Peach Creek* are silicified trees.

Capote Hill is a conspicuous object, being isolated in the prairie and 350 feet above it, composed of indurated silicious matters, and masses of a silicious marl with fossil volute shaped shells found about it. Above Colombia on the Brazos is a singular series of undulations, above 100 feet high and a mile in circumference, the only eminence that breaks the uniform level of the surrounding prairies. Of this mound, I am informed, that disintegrated limestone, gypsum, oyster, and other shells, comprising a great variety of marine exuviae, are the constituent parts.

At *Brazoria*, a well dug 20 feet deep gave impressions of fish in a sandy strata.

Cibolo Creek.—We now approach the healthy western country, with its nutritious pastures of Musquit and Gama grasses, mimosas, acacias, sumach (20 or 30 varieties), used by the Indians instead of tobacco, cacti, clear streams full of fish and river turtle.

Under 2 feet surface soil are seen conglomerates of rounded pieces of limestone, layers of sand, and here and there large fossil shells, like the oyster, as well as large slabs of sandstone.

In Texas there are prairies of such extent as to be monotonous, and to the mere traveller, soon become irksome—yet it is full of animal and vegetable life.

“These are the gardens of the Desert—these
The boundless unshorn fields where lingers yet
The beauty of the earth.”

The open wood-girdled lands, which the early French settlers in the Mississippi valley distinguished by the name of “Prairie,”

or meadows, and which are called "Savanas" by the Spaniards, form the characteristic features of much of the landscape of Texas. The surface of the prairies is termed "Rolling," from the resemblance to the long, heavy swell of the ocean when its waves are subsiding after a storm.

The attractions of the prairie consist in its extent, its verdure and flowers, its undulating surface and fringes of timber.

If it be in the spring, the young grass has just covered the ground with a carpet of delicate green. When the eye roves off the plain to the groves or points of timber, these are also found to be, in this season, robed in the most attractive hues. The rich undergrowth is in full bloom, filling the air with fragrance.

In the summer the prairie is covered with long grass, which soon assumes a golden hue, and waves in the wind like a ripe harvest.

As the season advances from spring to midsummer, the individual flowers become less beautiful when closely inspected; but the landscape is far more variegated, rich, and glowing.

In the prairie country, at certain seasons the red bug is most annoying to travellers—the remedy being to grease the body with salt bacon fat, which allays the irritation, kills the bug, which then appears under the skin like small blood-red specks.

The principal animals seen on the prairies are deer, mustang, fox, wolf, puma, jagua, ocelot, hare, rabbit, wild turkey, prairie hens, &c., and approaching the mountains, which are covered with woods, the bear, the graceful antelope, and powerful bison roam.

To these mountains succeed high table-lands, of which we know very little. Continuing westerly we arrive at the Rocky Mountains.

San Antonio de Bejar is historically the most interesting spot in Texas, as having been the continual battle ground of the Old Spaniards with the Indians, and in later years the Mexicans with the Texans. Here was placed the principal "Mission," which, in addition to its ecclesiastical functions, took upon itself military duties. There were several of these "Misiones" on the beautiful San Antonio river, but they have now fallen into ruin.

The rock of this section is known by the name of the San Antonio limestone, in which small shells are observed, and nodules of sulphuret of iron. It is the building material of the settlement, and easily quarried.

San Antonio to Cañon de Ugualdo.—I had the opportunity of accompanying an armed party west, in pursuit of some Comanches who were infesting the frontier. Our trail lay over an undulating and hilly country, covered with fine pastures and herds of mustangs; then over ridges of rather rugged character. Independ-

dently of finding honey in the hollows of trees, we found it in small caves.

This was so hurried a trip, that all I got was a rough sketch of the Cañon, or Valley, which is a favourite Indian camping-ground. We found a few friendly Lipans, who informed us that the Comanches were far off in the mountains. This valley is reputed to contain gold-mines.

The *Springs of the San Pedro* gush out of the "rotten limestone," which seems to be a deposit from the limestone rocks in the vicinity. Here ammonites and other fossil shells are said to be found.

Springs at the Head Waters of the San Antonio.—From numberless rivulets four large streams unite to form this river. The springs are hemmed in by thick woods, which give cover to the wild turkey.

SECTION III.—*San Antonio to the Guadalupe Mountains.*

The *Salado* country is undulating, covered with post-oak and other timbers: it is strewn with "rotten limestone," and silicious pebbles are met with.

The *Cibolo*.—Broken hilly country, and very bad for travelling. Limestone in large masses is strewn about, and in the ravines it is seen to be stratified.

1st *Sabinas*.—Here are the sources of these streams, springs rushing out of the mountains. The steep and rocky banks have a shelving appearance, as if formed by the retiring of waters: this same appearance is observed on the sides of the ranges of hills; the surface of the ground is strewn with isolated masses of rock of all dimensions. This is a wild-looking and Indian country; and no one lays himself down on his saddle-cloths at night without having his bowie-knife ready and his hand near to his rifle.

Guadalupe Valley.—Independently of ordinary game, there is abundance of wild cattle and black bear. This is a most picturesque locality, with clear skies, fresh air; and, thanks to its healthiness, I got rid for a time of fever.

There are localities in this valley that might be advantageously colonized, particularly for grazing.

What are called rivers in Western Texas are, in the majority of instances, merely creeks, and these not generally navigable. During the rainy season large volumes of water rush down from the mountains, forming "freshets," after which the streams dwindle down to mere rills.

These mountains have the reputation of containing silver-ore in particular.

2nd *Sabinas*.—We crossed this at the "Escalera" (ladder),

an almost perpendicular rocky pass, and from thence, by the Pinta trail, to San Antonio.

SECTION IV.—San Antonio to Head Waters of the Leona River.—Passing the Leon and Medio Creeks, the country seen is prairie, covered with flowers and rich pastures, alive with deer and antelope. To the N. and N.W. are mountain ranges, where roves the buffalo.

Cañon crossing of the Medina.—Here is found sandstone with oyster shells.

Upper Chican Creek.—This is a favourite haunt of the bee-hunters. The hills and valleys are strewn with rounded silicious stones, and in the deep creeks the same are found in horizontal layers.

Tahuacano is a favourite camping-ground of the Indians of that name, and the country a carpet of flowers and rich pastures.

Arroyo Seco, one mile from which is a ridge of white sand, called *Tierritas blancas*.

Rio Frio has steep banks of rounded silicious conglomerate; under this are beds of indurated sand and rounded pebbles.

La Leona is formed from clear springs—has a rocky bottom with falls, where slabs of sandstone are met with. The underwood is very thick, and we had to cut our way through it with hatchets. Met with loose pieces of silicious rock.

Head Waters of the Leona.—The Spanish fly is here met with in large quantities. We now find our maps very erroneous. In the distance are seen the Guadalupe Mountains, some 2000 feet above the sea, their bases covered with woods.

SECTION V.—From Wool's Road down the Rio Frio, &c.

Rio Frio has a pebbly bottom.

Castle Hill is composed of silicious rock, with veins of finely crystallized quartz running through it.

Olmos Creek.—The elms are very large. We saw much hard silicious ironstone. The lands are pretty good, but would be better had they a stiff subsoil. The banks of this creek, 100 feet deep, are composed of sand and clay, coloured with oxide of iron.

Descending towards the coast, prairie land alone is seen, coloured with oxide of iron. There is much heavy brushwood, and also cactus, palmetto, and agave. Wild cats, rattlesnakes, tarantulas, and centipedes are found.

Camp Bollaert, on the Nueces River.—Here are indications of salt, making the streams brackish.

Still descending towards the coast by the prairies, we meet with silicious pebbles, whole and broken, sometimes of pure quartz, and occasionally large rounded masses of silicious rock, sometimes coloured by oxide of iron. This is a very wild-looking district.

In these prairies are found large collections of bones of the mustang or wild-horse.

Sause Creek.—This is brackish.

The Rio Frio crossing is good country for sheep-farms. Silicified wood and outbursts of San Antonio limestone are found.

SECTION VI.—*Rio Frio to Corpus Christi on the Gulf, by the River Nueces.*—The trail goes over rocky, hilly ridges, covered with almost impenetrable underwood. A Mexican muleteer we had with us was always exclaiming, "Por Dios, que camino tan horroroso!"—What a horrible track! The lands appear good. Here we were watched by a strong body of Comanches, and it required the greatest caution not to fall in with them—no lighting of fires—no shooting; and in this way had to travel for many days with little or no food, when we came down upon the deserted settlement of San Patricio.* The river Nueces was 20 feet deep and 100 wide. Having rafted across, our course lay through fine Musquit grass country to Corpus Christi. No sooner had we arrived than a party of Comanches made their appearance on the heights. As we had been about a month in the wilderness, ourselves and horses were too fatigued to go out after our Indian enemy: the settlers, however, went and had a skirmish, routing them and bringing in some of their trappings and arms. Thus excursions in this section of Texas are not without some degree of excitement. One of our party died from privation, sickness, and fatigue. I returned to Galveston by sea, examining the several parts of the coast, the results of which have been already alluded to.

SECTION VII.—*Colombus on the Colorado to the Trinity River up it, and then down it to Galveston.*

Mill Creek.—Here are many thriving settlements, where, amongst other things met with, are fine tobacco and indigo, the latter prepared from the wild plant.

Washington on the Brazos. All this country is one continued rich alluvion, but subject in the autumn to fevers.

Montgomery is surrounded by "pine barrens," the soil being very sandy, in which the pines appear to luxuriate: there are, however, other trees.

Hunstville.—The same sandy land, but undulating; the "bottoms" rich and good for cotton lands. Sulphur-springs abound here, and in the vicinity fossil bones are said to be found.

Cincinnati on the Trinity is on a high bluff, surrounded by low

* The Comanches, no doubt, took us for the advance of a large party, or they would have attacked, and the result might have been disastrous to us.

and rich "bottom" lands. We left by steamer, going up the Trinity River. At a spot called *Oceola*, in some maps it is marked as producing coal. An American company was formed to work it, and parties came to the spot, but on examination did not find any.

The geological character of this region is rich surface soils (containing cane-brakes) reposing on sand, which in some places is indurated with a small portion of calcareous matter, and called, as we have before stated, by the settlers "rock."

What has been denominated *coal* by speculators is only recently decomposed or slightly bituminized vegetable matter, having a blackish colour, and at times for short distances puts on the appearance of being in narrow horizontal layers, but of no continuity.

Coal has been reported to exist in other parts of Texas, but it appears to me with no better foundation than at *Oceola*.

Alabama is a cotton-growing country, of similar geological and geographical character as at *Cincinnati*, the sandstone more indurated.*

Cincinnati down the Trinity River to Galveston.

Wright's Bluffs are formed of sandy strata, declining about 6 degrees to the S.E.

Carolina Bluffs are 150 feet high; indurated sandy strata, and sufficiently so for building. Generally speaking, if there be a bluff on one side of the river, on the other it is low, allowing the stream to inundate it during the "freshets."

Swartout is high river land, and below this are forests of *Magnolia*.

Red Fish Bar.—This is a chain of low islets, rapidly forming of sand, mud, and shells, and will doubtless at no distant period elongate the peninsula of East Bay.

From Dallas on the Trinity River to Galveston is nearly 800 miles.

So far in this communication the observations have been made by myself, but to render it more complete I will add some remarks of other travellers.

Goliad.—Here is soft limestone, similar to that of San Antonio; it becomes hard by exposure to the air.

Medina River County.—Consists of black loams, flint pebbles, and is hilly.

The Nueces and onwards has much sandy waste, with caeti, agaves, and musquit wood.

* "In Houston county are found ironstone and limestone. In the middle and northern parts are found great numbers of silicified trees, embedded in the soil, some in a horizontal position; but most of them are nearly upright, and leaning towards the north, as if they had been fixed in that position by the alluvial deposit precipitating suddenly from a current flowing from the south, and partially elevating them on one of their ends. They are of a light gray or reddish brown."

Rio Grande, at the Presidio, is a fine stream, 300 feet wide, but varying much in depth. Going up the river low limestone hills are met with, from which issue clear springs.

El Saucillo is a deep brook, "the banks of a most curious formation." (No particulars given.)

Dolores, in $29^{\circ} 20' N.$, $101^{\circ} 40' W.$ has good land, and well wooded. At the head of the stream of *Dolores*, towards the mountains, we found them to be composed of a very compact granite, and a fine species of soft limestone.

From Dr. Smith's Observations on North-Eastern Texas.

Assumes Shreveport, on Red River, in lat. $32^{\circ} 30'$, $93^{\circ} 45' W.$, and to be 500 feet above the sea: it is found to be an alluvial country. The first point that strikes the traveller is a succession of inland lakes, formed by the backing up of the waters of Red River, owing to large rafts being below the spot; those called Sodo and Clear Lakes are of recent formation, and many remember the period when the land was dry. The Indians say these lakes were formed after a great earthquake, supposed to be that of 1812, when New Madrid and other places on the Mississippi were ruined.

In *Harrison County*, 20 miles W. of *Marshall*, its capital, is a well 16 feet deep, giving clay and white sand.

Van Zandt's County.—Near the Sabine is Jordan's saline, one of many such in N.E. Texas. It is on a salt prairie, the brine being produced from wells 20 feet deep.

Dallas, the capital of the county of the same name, is on the Trinity, in the vicinity of which is elevated land 500 to 1000 feet above the sea, with bluffs on the river 100 feet high, composed of thin layers of very hard sandstone, followed by magnesian limestone, and then thick layers of limestone suitable for building purposes. In these limestones are found nodules of ironstone and sulphuret of iron. Gypsum abounds also, and soapstone and toadstone are met with.

Paris, Lamar county, $33^{\circ} 40' N.$, $95^{\circ} 50' W.$ In sinking a well 56 feet deep, strata of sand, red clay, and soapstone, were seen. In Sulphur Prairie, a well 23 feet deep, gave 20 feet yellow clay, and 14 feet ironstone marl. The sulphur springs are abundant.

Blue lias is met with several feet below the surface on the North Sulphur Fork of the Red River, which makes good lime.

Red River County.—The rock is principally of a soft limestone and some soapstone.

In *Titus County* ironstone abounds, but no indication of coal.

At *Jefferson*, on the big Cypress River, a well 28 feet deep gave 20 of yellow clay, and 4 ironstone marl. Dr. Smith speaks

of the rapid elevations of the river bottoms in this section by matters brought down from the interior.

I am indebted to a friend for the following :—

From Franklin, in Robertson County, to the Arkansas River.

Between the Trinity and Red Rivers there is a high ridge of land with the "Cross Timbers" in sight.

Going westerly, along Red River by the "Lower Cross Timbers," which is part of a belt of beautiful woodland, extending from the Missouri to the Brazos, running about N. and S., were discovered ammonites, encrinites, and trilobites. The rock of the country is principally of "rotten limestone." Limestone and sandstone in horizontal strata.

Upper Cross Timbers, in 34° N. 99° W., are high ridges of land, barren and sandy, with rocks broken in places.

Red River.—We crossed it in 34° and 100° W. The lands on its banks rich, of a vermilion colour, owing to the presence of iron.*

In Vallies between the Wichitan and Kiaway Mountains.

Here is a very fine country with plenty of game. There are however rocky rugged tracts. We ascended a mountain 2000 feet above the prairie; sulphuret of lead was in abundance; and subsequently, indications of gold were said to have been met with.

The *Canadian River* is 400 to 500 yards wide, not deep, waters reddish, its "bottoms" are narrow, and little timber. The country is broken with high ridges and deep ravines, with perpendicular precipices.

On *Canadian River* (North Fork), the face of the country is barren, with sand hills, rugged, and cut up with deep ravines.

The *Lower Cimaron River* is seen to wend its way from the high lands, through monotonous prairies of great extent, on which roam vast hordes of buffalo. Salt marshes occur, the crystals of salt being large.

On the *Upper Cimaron River* caves were discovered in sandstone rock, and sulphuret of lead found. Three mouths to one cave were discovered, and we examined the principal entrance, capable of holding a dozen men; it was explored, and a large chamber 6 to 7 feet high, and 20 in diameter, was found, containing stalactites, and filled with bats. Here were hills in the

* Here it was reported that bones of large reptiles had been found—probably saurians.

vicinity composed of quartzose rocks, with seams of mica from 1 inch to 2 feet thick; the said seams running in every direction.

Continuing northerly the lands are black and rich, well wooded and watered, with coarse sand in the beds of the streams. Large prairies succeed with much game and buffalo.

The *Arkansas River* here is in 101° W. and $37^{\circ} 50'$ N. The banks are 2 to 3 feet high, and water 20 feet in depth (May and June). Ranges of sand hills are seen on its banks; these are continually changing their position, are 20 to 30 feet high, and 200 to 300 yards at their base. Prairies of great extent stretch towards the north.

Dog villages fallen in with on the route to *Bents Forts*, 160 miles up the *Arkansas*, at which point it was crossed.*

From San Patricio, on the *Nueces*, to Camargo, on the *Rio Grande*, in a N.E. direction. Having rafted over the *Nueces*, the little stream of *Las Pintas* is arrived at, which runs into *Corpus Christi Bay*, 5 or 6 miles S.E. of *Grayson*. Between San Patricio and *Las Pintas* there is a succession of "Water holes" (deposits from rains) with a good grazing country, covered with rich musquit grass. *San Fernando* seldom runs a stream, but has abundance of "water-holes." *San Gertrudez*, 45 miles from San Patricio, is a small stream, having some musquit timber (species of mimosa), and on its banks abounding with the nopal. Towards the *Olmos* is a poor country; it is a "chaperal," composed of sandy land and thorny bushes. The next timber met with is the "Owl's Roost," composed of "scrub oak," and about here are salt-lakes. The large salt lake may be in about 27° N., 98° W. Greenwich, and 10 to 15 E. of the main track or trail. Water about here is only found in holes.

The "Encinal" is now approached. This is an extended rolling sandy ridge (no water), of 6 to 8 miles wide, with some scrub oak. This is known as the great dividing ridge between the *Nueces* and the *Rio Grande*, commencing at the coast, and running towards the mountains in a N.W. direction. A sandy prairie follows, keeping the road to Camargo. On the edge of the "bottom" of the *Rio Grande* (which bottom is sometimes 30 miles in width) wells have been sunk to 50 feet before water was attained.

On the southern bank of the *Rio Grande* the land is rolling and wooded, with much game and wild horses. Here limestone is seen.

The estimated distance from New Orleans by land to the city of Mexico, across Texas, is 1620 miles.

From the foregoing remarks it will be seen that Texas affords an extensive and but little explored field for the geographer,

* Rocks of volcanic origin are said to have been found in this district, overlying the red sandstone.

geologist, &c. The small masses of granite found in the hilly region of the Colorado indicate that the primitive rocks are to be found near the sources of that stream.

If we may credit the narrations of hunters and trappers, there can be little doubt that Texas embraces the principal geological formations from the primary to the most recent deposits.

The imperfect explorations that have been made indicate that the sedimentary rocks of the country have not been subjected to those revolutions which have broken up and contorted other parts of America; but have been deposited in a comparatively tranquil sea, and gradually lifted up from its bed.

The observations which confirm this are confined to the tertiary and older secondary formations.

Along the coast a series of superficial accumulations extend inland from 100 to 150 miles, comprising the level and undulating regions; these accumulations consist principally of beds of calcareous and arenaceous substances, generally intimately blended; in places the arenaceous predominates with some argillaceous, and, when they approach the surface, communicate a clayey and sandy character to the soil.

These beds vary in thickness: near the coast they may be 100 feet thick; 50 miles inland about 60 feet; and gradually become less thick in the higher portions of the undulating region.

The fossil bones are found imbedded in this formation in various portions of the undulating region. Shells similar to those found upon the Gulf shore are seen imbedded in these deposits 30 feet above tide-water, particularly in the San Jacinto (near Houston). These superficial accumulations rest upon indurated sand or sandstones; and in some places in the ravines, worn by the small streams, a kind of marly or "rotten limestone" is found beneath the sandstone.

In the higher portions of the undulating region the sandstones protrude through the soil, and in places they are seen in long irregular ridges, evidently waterworn, resembling a rocky beach, with trunks of silicified trees found lying against these ridges.

The sandstones vary in texture, such as the coarse sands and comminuted shells, enclosing rolled silicious pebbles; in others, fine grained, and resembling freestone.

About the undulating region, and at the distance of 150 miles from the coast, the secondary rocks appear above the surface.

They are arranged nearly horizontal, forming hills with flat summits, 5 to 600 feet high, their strata consisting chiefly of limestones, containing fossils and organic remains.

The soft white limestone on the borders of the undulating lands may belong to the calcareous group. Nodular masses of sulphuret of iron are contained in these strata.

From what has been said, it would appear that the part of Texas lying within 200 miles of the coast, and perhaps further inland, has been gradually uplifted from the bed of an ancient sea, into which the great rivers of that period poured their waters charged with the detritus of the secondary rocks. This detritus was gradually deposited in sedimentary beds at the bottom of the sea, and these deltas at length uniting formed the superficial accumulations of the level and undulating lands. This appears to be confirmed by the fact that the soils in the vicinity of the great rivers are distinguished by the peculiar ingredients of the sediments brought down by the annual "freshets" of the present day. In the vicinity of Red River the soil is so red, even many miles from that stream, that those sections are known as the "rich red lands."

In the vicinity of the Colorado extensive beds of silicious pebbles are found scattered abroad over the country several miles from the stream, and even on low hills, now far above the reach of its greatest annual "freshets."

A superficial observer might be induced to attribute these beds to a diluvial agency. Indeed, upon a slight examination, it might be inferred that a mighty current of water, sufficiently powerful to sweep onward immense volumes of mud, sand, and stones, has at some former period deluged this section and deposited the present soil upon the sandstones and marly limestones beneath. But a more careful examination will show that these rolled pebbles are silicious, and are precisely similar to those that line the banks of the Colorado, and are still brought down by its freshets. It seems evident, therefore, that while this section was merged beneath the waters of the ancient sea which once extended over these hills, the Colorado, even at that distant period, conveyed the same materials to form its ancient delta that it does at the present day. The materials which were at first deposited on the bed of the sea, were swept from place to place by the marine currents, and now, since the waters have retired, appear upon the summits of hills at a distance from the stream whose agency detached them from their parent bed.

Thus, then, we see Texas to be composed of rich surface soils, followed by part of the tertiary strata, with its peculiar fossils.

As yet the chalk formation is not made out; then follow parts of the oolitic system, with its ammonites, &c., and perhaps the new red sandstone.

The carboniferous and mountain limestone is yet to be discovered, and ultimately we come to well-defined quartzose rocks; and, lastly, to the granite of the Rocky Mountains, the backbone of the American continent, which, regarded by the Red Man with superstitious awe, is called by him "the Crest of the World."

APPROXIMATE SECTIONS of Country in Texas, commencing at Galveston Island, on the Gulf of Mexico, to Austin, the Capital.

	Distances.	Elevation above the Sea.	Direction.
SECTION I.			
	Miles.	Feet.	
Galveston Town, 5 feet above Sea . . . . .	..	10	..
Eagle Grove (on the island)	5	5	S.W.
Virginia Point (on the main land)	1	10	W.
Clear Creek	24	50	N.W.
Houston (the Town); river at times 30 or 40 feet below it	18	60	W. by N.
Wheaton's farm (on Buffalo Bayou)	18	100	W. by N.
Miskel's farm (on edge of Brazo's "bottom")	16	150	W.
San Felipe de Austin (on Brazos River)	6	200	W.
San Bernard River	12	200	W.
Edge of the Colorado "Timbers"	13	200	W.
Columbus (on the Colorado River)	6	250	W.
La Grange	30	300	N.W.
Hardman's Plantation	22	320	N.W.
Bastrop	10	370	N.W.
Webber's Prairie	15	350	N.W.
Austin (the capital)	15	450	N.W.
Mount Bonnell (here the mountains rise rapidly on the west) . . . . .	..	700	..
SECTION II.			
<i>From Columbus to San Antonio.</i>			
Columbus . . . . .	..	250	..
Navidad River	20	250	S.W.
Foley's Plantation (Nixon's Creek)	15	260	S.W.
La Vaca River	6	260	S.W.
Big Hill Range	18	300	S.W.
Gonzales (on the Guadalupe River)	10	270	S.W.
Erskin's Plantation (on ditto)	18	300	N.W. by W.
Capote Hill (height from the Prairie) . . . . .	..	350	..
Seguin (on the Guadalupe)	12	300	N.W. by W.
Santa Clara Creek	10	300	W.S.W.
Cibolo River	5	300	W.S.W.
Salado River	15	300	W.S.W.
San Antonio de Bejar	5	350	W.S.W.
SECTION III.			
San Antonio de Bejar . . . . .	..	350	..
Springs or head water of the San Antonio	4	400	N.W.
Salado River	9	450	N.W.
Cibolo River	10	550	N.W.
1st Sabinas River	10	700	N.W.
2nd Sabinas River	10	800	N.W.
Guadalupe River	10	1,000	N.W.
Peaks of the Guadalupe Mountains	20	3,000	N.W.

APPROXIMATE SECTIONS of Country in Texas—continued.

	Distances.	Elevation above the Sea.	Direction.
	Miles.	Feet.	
SECTION IV.			
<i>San Antonio to Head Waters of the Leona River and Guadalupe Mountains.</i>			
San Antonio de Bejar . . . . .	..	350	..
Leon Creek	5	350	W.
Media Creek	6	350	W.
Potranca Creek	6	350	W.
Medina River (Presidio Road)	4	400	W.
Ditto at the Cañon Crossing	10	450	W. by N.
Chican Creek (Upper)	8	500	S.
Presidio Road	8	400	S.W.
Tabuacano (Indian Camp)	6	400	S.W.
Arroyo Seco	6	400	S.W.
Rio Frio (Camp Cortados)	12	450	S.W.
Presidio Road	3	450	S.W.
Los Olmos, or Elm Creek, Camp Grieve	7	470	W.N.W.
Rio Frio	8	460	N.E.
Musquit Camp	2	460	W.
Rio Frio, Camp Paso del Toro	2	460	N.E.
Through Slough	3	460	W.S.W.
Rio Frio, Camp Trout	6	460	W.S.W.
La Leona River, Fat Cat-fish Camp	15	500	N.W.
Bee Tree Camp	2	500	N.W.
La Leona River (here General Woll's Road (Trail) crosses	6	520	N.W.
Head Waters or Springs of La Leona	5	550	N.W.
On Woll's Road	5	520	E.
Guadalupe Mountains	30	2,000	N
SECTION V.			
<i>From Woll's Road to Rio Frio Crossing.</i>			
On Woll's Road . . . . .	..	520	..
Rio Frio (Castle-hill Camp)	5	520	E.
Rio Frio (Camp Comanche)	10	500	S.S.E.
Pringle's Creek	7	500	S.W.
Camp Stevenson	9	480	S.E.
Presidio Road	7	460	S. by E.
Pringle's Creek (Presidio Road)	3	460	E.
Olmos Creek (ditto)	6	460	E.
Junction of the Olmos and Rio Frio Rivers	10	440	E.S.E.
La Leona River (Peccan Ford)	14	440	S.
Rio Nueces	30	440	S.
Gully	8	440	E. by S.
Rio Nueces (Camp Bollacrt)	8	430	S.
Buck-Rabbit Camp	8	440	S.E.
Rio Nueces (Camp Pritchett)	10	430	S.E.
Laredo Crossing	8	420	..
Sause Creek	6	430	N.
Guadalupe Water-holes	13	420	N.
Rio Frio Crossing	17	400	N.

APPROXIMATE SECTIONS of Country in Texas—continued.

	Distances.	Elevation above the Sea.	Direction.
	Miles.	Feet.	
SECTION VI.			
<i>From Rio Frio Crossing to Corpus Christi, on the Gulf.</i>			
Rio Frio Crossing . . . . .	..	400	..
Leona Creek	6	400	..
San Miguel River	12	380	..
La Parita Creek	9	380	..
Junction of the Frio and Nueces Rivers	9	360	..
Punta Piedra Creek	5	350	..
Waterloo Valley	7	320	..
Nueces River	10	320	E.S.E.
In Prairie	15	320	..
Nueces River	20	300	..
Ditto	18	250	..
Ditto	15	200	..
Rains of Town of San Patricio, on the Nueces	5	180	..
Corpus Christi, on Gulf of Mexico	25	80	..
SECTION VII.			
<i>From Columbus on the Colorado, to Trinity River, up it, and down to Galveston.</i>			
Columbus . . . . .	..	250	..
Mill Creek	22	270	N.E.
Ditto (West Branch)	4	270	N.E.
Jacksonville	14	270	N.E.
Washington, on the Brazos River	12	300	N.E.
Lake Creek	24	300	N.E.
Montgomery	6	320	N.E.
Huntsville	30	320	N.E.
Cincinnati (on Trinity River)	12	250	N.N.E.
Alabama (by land)	50	370	N.W.
Magnolia (by land)	50	450	N.W.
Fort Houston	10	500	N.E.
Distance from Dallas on the Trinity River, to Galveston Bay, 773 miles.			

NOTE.—Colonel Long, of the United States Engineers, gives the altitude of the Great Plain of the Northern Texas—say the sources of Red River—to be 830 feet above tide-water: this would give an average of 600 feet—therefore, assuming this plain to be 300 miles from the Gulf, there would be a fall of 2 feet per mile.

TABLE of Latitudes and Longitudes of Places in Texas, &c., as determined principally by Observations of Engineers of the United States.

	Latitude N.	Longitude W. of Washington.	Longitude W. of Greenwich.
Mouth of the Sabine River (the Mound)	29° 41' 27"	16° 48' 44"	93° 50' 14"
Dr. Everett's House	29° 43' 54"	16° 50'	93° 51' 30"
(Average rise and fall of the tides 18 inches; variation of the compass 8° 40' 20" Feb. 1840.)			
Belgrade (on the Sabine)	30° 37' 38"	16° 38' 48"	93° 40' 18"
Sabine Town "	31° 23' 5"	16° 40' 15"	93° 41' 45"
Gain's Ferry "	31° 28' 15"	16° 43' 2"	93° 44' 32"
Logan's "	31° 58' 24"	16° 58' 32"	94° 00' 2"
Dip by 2 needles, 61° 36' (4 June, 1840).			
Nacogdoches	31° 36'	17° 36'	94° 37' 30"
San Antonio de Bexar	29° 25'	21° 38'	98° 39' 30"
Oceola (on the Trinity River	30° 50'	18° 48' 30"	95° 50'
Austin (Capital of Texas)	30° 19'	21° 19' 30"	98° 21'
Santa Fé (New Mexico)	36° 12'	27° 38' 20.5"	104° 39' 50.5"
Paso del Norte (Presidio)	32° 9'	27° 38' 10.5"	104° 39' 40.5"
Chihuahua (in Mexico)	28° 38'	25° 46' 8.5"	102° 47' 38.5"
San Felipe de Austin (Brazos River)	29° 50'	19° 15'	96° 16' 30"

NOTE.—In the above Table the Longitude of Washington is taken to be 77° 1' 30" West of Greenwich.

In my previous communication on Texas I gave Moore's observations of latitudes and longitudes of the principal points on the coast.

Mr. Barrow gives for N.E. Texas, in June, 1849, between 1 and 12 A.M., 77°, once 88°, three times 86°, and as low as 58° and 64'. In the sun 108° Fahr.*

LATITUDES and LONGITUDES, from a small work by Dr. E. Smith, on N.E. Texas, copied from Observations of the U. S. Engineers.

	Latitudes N.	Longitudes W.
Shreveport	32° 30'	93° 45' Greenwich
Jefferson	32° 46'	94° 30' "
Dangerfield	33° 00'	94° 45' "
Mount Pleasant	33° 15'	95° 00' "
Tarrant	33° 20'	95° 50' "
Paris	33° 40'	95° 50' "
Bonham	33° 50'	96° 15' "
M'Kinney	33° 15'	96° 55' "
Dr. Conover's (Dallas County)	32° 40'	96° 40' "
M'Gee's (Van Zandt County)	32° 25'	95° 40' "

* For history of Texas, see my communications in 'United Service Magazine' for November, 1846, January and April, 1847, by "A Traveller."

Land Districts.	Counties.	County Towns.
Austin . . composed of	Austin	Belle Ville
Bastrop . . "	Bastrop	Bastrop
	{ Bejar-Santa Fé	San Antonio
	{ Medina	Castroville
Bejar . . . "	{ Gillespie	Fredericksburg
	{ Comal, S.W. part of	New Braunfels
	{ Guadalupe	Seguin
	{ Webb, above Laredo Road	Laredo
Bowie . . . "	{ Bowie	Boston
	{ Cass	Jefferson
	{ Titus, E. part of	Mount Pleasant
Brazoria . . "	{ Brazoria	Brazoria
Brazos . . . "	{ Brazos	
Colorado . . "	{ Colorado	Columbus
	{ La Vaca, N.E. part of	Petersburg
	{ Wharton, N. part of	Wharton
	{ Fannin	Bonham
	{ Hunt, N. part of	Greenville
	{ Grayson	Sherman
Fannin . . . "	{ Collin	M'Kinney
	{ Denton	Atton
	{ Cooke	
	{ Territory W. of Cook County	
Fayette . . . "	{ Fayette	La Grange
	{ La Vaca, part of	Petersburg
Fort Bend . . "	{ Fort Bend	Richmond
Galveston . . "	{ Galveston	Galveston
Goliad . . . "	{ Goliad	Goliad
	{ Dewitt, W. part of	Curo
	{ Gonzales	Gonzales
	{ Caldwell	Lockhart
Gonzales . . . "	{ Dewitt, N. part of	Cuero
	{ La Vaca, N.W. part of	Petersburg
	{ Guadalupe, N.E. part of	Seguin
Harris . . . "	{ Harris	Houston
	{ Houston	Crocket
Houston . . . "	{ Auderson	Palestine
	{ Henderson, S. part of	Buffalo
	{ Van Zandt, S. part of	Jordan's Saline
	{ Harrison	Marshall
Harrison . . . "	{ Upshur, E. part of	Gilmer
	{ Panola, E. part of	Carthage
	{ Jackson, E. part of	Texana
	{ Calhoun, E. of La Vaca Bay	Port La Vaca
Jackson . . . "	{ Matagorda, W. part of	Matagorda
	{ Wharton, S.W. part of	Wharton
	{ La Vaca, part of	Petersburg
Jasper . . . "	{ Jasper	Jasper
	{ Newton	Burkeville
Jefferson . . . "	{ Jefferson	Beaumont
La Mar . . . "	{ La Mar	Paris
	{ Hopkins, N. part of	Tarrant
	{ Liberty	Liberty
Liberty . . . "	{ Polk	Livingstone
	{ Tyler	Woodville
Matagorda . . . "	{ Matagorda, E. part of	Matagorda
	{ Wharton, E. part of	Wharton

Land Districts.	Counties.	County Towns.
Milam . . . composed of	Milam	Cameron
	Barleson	Caldwell
	Williamson	Georgetown
	Montgomery	Montgomery
Montgomery "	Walker	Huntsville
	Grimes	Anderson
	Nacogdoches	Nacogdoches
	Angelina	Marion
	Cherokee	Rusk
	Smith	Tyler
	Upshur, W. part of	Gilmer
Nacogdoches "	Van Zandt, N. part of	Jordan's Saline
	Henderson, N. part of	Buffalo
	Kaufman	Kaufman
	Dallas, E. part of	Dallas
	Hunt, S. part of	Greenville
	Hopkins, S. part of	Tarrant
	Red River	Clarksville
Red River . "	Titus, W. part of	Mount Pleasant
	Robertson	Franklin
	Leon	Leona
Robertson . "	Limestone	Springfield
	Navarro	Corsicana
	Dallas	Dallas
	Rusk	Henderson
Rusk . . . "	Panola, W. part of	Carthage
	Sabine	Milam
Sabine . . . "	San Augustine	San Augustine
San Augustine "	Shelby	Shelbyville
Shelby . . . "	San Patricio	San Patricio
	Nueces	Corpus Christi
San Patricio, and	Cameron	Santa Rita
Nueces . "	Starr	Rio Grande
	Webb, below Laredo Road	Laredo
	Travis	Austin City
Travis . . . "	Hays	San Marco
	Comal, N.E. part of	New Braunfels
	Victoria, E. of Coleta Creek	Victoria
	Calhoun, W. of La Vaca Bay	Port La Vaca
Victoria . . . "	Jackson, W. part of	Texana
	Dewitt, S.E. part of	Cuero
	La Vaca, S. part of	Petersburg
Washington . "	Washington	Brenham

The American Government has just ordered an accurate survey of the coast to be made, which will be followed doubtless by that of the interior; and it is in contemplation to divide Texas into two states.

VIII.—*Extract of a Letter from Commander Mathison, of H.M.S. 'Mariner,' to Captain E. M. Troubridge, of H.M.S. 'Amazon,' dated 14th July, 1849, at Shanghai.* Communicated by the Admiralty.

[Read January 28th, 1850.]

SIR,—I HAVE the honour to inform you, for the information of the Commander-in-Chief, that, in obedience to orders from his Excellency dated 14th May last, I proceeded in H.M.S. 'Mariner,' under my command, on the 17th of that month to the coast of Japan, and anchored on the 29th May off the town of Oragawa, situated 25 miles from the capital of the empire, three miles further than any other vessel has been allowed to proceed, sounding all the way across and along the shore of Japan.

Having a Japanese on board, who acted as interpreter, he informed the authorities of the object of my visit. I sent my card, written in Chinese, ashore to the Governor, requesting him to name the time he would receive me. His reply was, that out of courtesy to me and curiosity to himself to see the ship, he would have liked very much to pay me a visit, and also entertain me ashore; but it was contrary to the laws of their country for any foreigner to land, and that he would lose his life if he permitted me to go ashore or to proceed any further up the bay.

When about 8 miles from Cape Misaki, which forms the S.W. end of the bay, ten boats came alongside, manned with twenty men and five mandarins in each, all armed with muskets and swords. The mandarins wore a sword and dagger.

I allowed the latter on board, when they presented me a paper written in French and Dutch, desiring me not to anchor or cruize about the bay, but remain at sea. Finding, however, that I was determined to proceed, and the wind falling light when within two miles of the anchorage, at 8½ o'clock they offered their boats to tow us up, which I accepted.

When the mandarins left the ship, several boats were stationed all round us during the night. Forts were lighted up, and about 400 boats, all manned and armed, collected along the shore, each carrying a lantern. By means of my interpreter, who was very much frightened, I made them keep at a respectable distance, had the guns loaded, and kept a watch on deck armed during the night in case of any treachery on their part. "Othoson," our interpreter, said he would not land on any account—that they would murder all of us, and, as for himself, they would torment him all his life.

Oragawa appears to be the key of the capital of the empire, contains 20,000 inhabitants, and could hold 1200 junks. All the

junks going and returning from Jeddo arrive here to pass the custom-house ; and with a moderate armed force the trade might be completely stopped, for Jeddo depends upon its supplies by sea. From the advantage a steamer has over a sailing vessel, there would be no difficulty in her surveying or sounding the passage up to Jeddo, which you can approach, as I am informed, within five miles. There is a very good road between the two towns.

The mandarins appear of an inferior class. They treated us civilly ; were anxious to gain every information, but to give none in return : they took sketches of different parts of the ship, sent us some water, vegetables, and eggs ; after which they were continually inquiring when I intended to depart.

I directed Mr. Halloran, the master, to make a survey of the anchorage, which I beg to forward along with his remarks and some of my own. The day was fortunately clear and fine ; generally speaking it is very foggy and misty.

On the 31st of May I weighed, and proceeded to Semodi Bay, where I remained $4\frac{1}{2}$ days to enable the master to take a more accurate survey of the bay, a copy of which I transmit herewith.

There are three fishing villages at this anchorage, where I landed for a short time ; but the mandarins followed, begging and entreating me to go on board. They supplied us with plenty of fish, and sent fifty boats to tow us out, so anxious were they to get us away. The weather detained me, however, two days at this anchorage, and the governor of the province came on board on the third ; he lives thirteen miles off, at a town called Miomaki. He was evidently a man of rank, from the respect shown to him by his followers.

The Dutch interpreter from Oragawa and two other mandarins made their appearance (after the second day) to watch our proceedings. They appear to be spies one upon the other, and would exchange scarcely anything, and that only by stealth.

On the 7th of June I again weighed, and returned to this anchorage on the 2nd of July.

IX.—*Extracts of Letters from the Rev. David Livingston, dated from the Missionary Station at Kolobeng, South Africa, 25° S. lat., 26° E. long.* (1.) Communicated by the London Missionary Society, and (2.) by Captain Thomas Steele, F.R.G.S., of the Coldstream Guards.

[Read February 11, 1850.]

(1.) On the 1st of June, 1849, we started from Kolobeng upon my long-projected expedition to endeavour to open a new field for our labours in the N., by traversing the Great Desert, as it is called, which, stretching far to the N.N.W., has hitherto proved an insurmountable obstacle to the further progress of Europeans in that direction.

Only last year a large party of Griquas, in about thirty waggons, made many and persevering efforts to cross it at different points; but, although inured to the climate and stimulated by the prospect of gain from the ivory they expected to procure, they were compelled from want of water to give up the undertaking.

Two English gentlemen, Mr. Wm. Cotton Oswell and Mr. Mungo Murray, to whom I had communicated my plan of penetrating to the Great Lake, reported to lie beyond the desert, came from England expressly to take part in the discovery; and to their liberal and zealous co-operation we are specially indebted for the success of the expedition. Whilst waiting for their arrival seven men came from the Batouani, or Batasana, a tribe living upon the shores of the lake, with an earnest request from their chief that I should visit them. As the path, however, by which they had reached Kolobeng was impracticable for waggons, I was obliged to decline their guidance, and proceed by the more circuitous route by which the Bamanguato usually pass, under the direction of some Bakuaains for guides, whose interest in our success was secured by a promise to carry any ivory they might obtain for their chief in our waggons; and right faithfully did they perform their task.

Our journey across the desert was one of great labour and suffering, from the want of water for our animals, till on the 4th of July, after travelling about 300 miles from Kolobeng, measured by the trocheameter, we happily struck on a magnificent river, the Zouga, from which point our further journey was comparatively easy; thence, winding along its banks for nearly another 300 miles, we reached the Batouani, on the great lake of Nğami, by the end of July.

(2.) The route is exhibited in the accompanying sketch, the latitudes being carefully taken by Captain Steele's beautiful sextant.

The desert through which lay the first half of our journey is

an immense plain, but not destitute of trees or grass: there is abundance of both, and of inhabitants, human and animal, there is no lack; but the extreme scarcity of water and other hardships have reduced the first to the most abject form of human kind. The Bakalihari and Bushmen have in general small thin legs and arms, large protruding abdomens, and countenances expressive of the hard life they lead. I regret to say that I had but little opportunity of holding any intercourse with these wretched inhabitants of the desert, for as soon as it was known we were about to commence our journey, Sekhomi, the chief of the Bamanguato, who was averse to any such entry upon his ivory store, sent out his people before us to drive all the inhabitants off the route, in the hope that, when deprived of their assistance in procuring water, we should be compelled to return, as the Griquas had been last year.

The Bakalihari, in order to obtain anything to drink, are often reduced to the following contrivance:—They insert a reed with a tuft of grass round one end of it, to act as a sort of filter, into moist parts of the desert, and then suck up the water into the mouth, and discharge it into their water-vessels, which are usually ostrich egg-shells. We obtained good supplies of water twice by digging wells in these spots. There are several roots which kind Providence seems to have provided for their special use in this arid region, amongst which one is worthy of remark. It appears above ground as a small plant three or four inches high, and about as thick as a crow-quill; the seeds are not unlike those of the dandelion, but about a foot below the surface of the earth it terminates in a root as large as a child's head, consisting of a spongy cellular substance full of pure cold water.

The miserable condition of these poor human beings contrasts surprisingly with that of the animals; but it is a well-ascertained fact that the eland, gemsbock, duiker, steinbock, &c., can live for months together without water. The eland becomes enormously fat during the driest season, viz. the winter, when all the herbage is withered, and so dry that it crumbles to powder in the hand. And yet the stomachs of all these animals, when opened, contained a good deal of moisture. Our party was well supplied with eland's flesh during our passage through the desert; and it being superior to beef, and the animal as large as an ox, it seems strange it has not yet been introduced into England.

The Zouga is really a very fine river. Its breadth at the point where we first found it entire was about 30 yards; and yet, unlike other rivers, it became wider and deeper as we approached its apparent source. The water was clear as crystal, soft, and very cold, and gave me an idea of melted snow—an idea which seems confirmed by its periodical rising at the commencement of our

warm weather. Our dry season extends from May to October. We found that the Zouga rose 3 feet in July and August. It runs about 3 miles an hour, and the water, as proved by its effect on our soap, became less impregnated with lime as we approached the source of its waters. The natives could give us no account of the cause of its periodical rise, but said it was not caused by rains. They told a story of a chief who lives in a country called Mazzekwa, in the far North, who was in the habit of killing a man every year, and throwing his body into the river; and then, they said, the river begins to flow. If their account is to be believed, it attains its greatest height about October, and then gradually decreases till June—a great portion of the decrease taking place in our rainy season. The keen cold air from the water increased our appetites amazingly. The point of ebullition by Newman's thermometer was $207\frac{1}{2}$, giving rather more than 2000 feet elevation.

With the periodical flow, large shoals of fish come down the river, which are caught by the natives with nets, or speared. The people living on the lake and rivers are a totally distinct race from the Bechuanas; they call themselves Bayeiye (or men), while the term Bakoba has somewhat of the meaning of slaves, and is applied to them by the Bechuanas. Their complexion is darker than the Bechuanas, and they speak a totally different language. Of 300 words which I collected, only 21 had any resemblance to the Sechuana. Some words have a click; but that does not occur so commonly as in the Bushman tongue. I admired the frank and manly bearing of these inland sailors; and often, whilst the waggons went along the banks of the river, took my seat in their canoes. These are truly a primitive craft, hollowed out of the trunks of single trees.

The banks of the river are generally of calcareous tufa, and lined with gigantic trees, some of them bearing fruit quite new to us. Two trees, of the baobab variety, measured 70 to 76 feet in circumference at about 3 feet from the ground. Palmyras and banyans gave somewhat of an Oriental appearance to some parts; and other trees of great beauty attracted our notice. One in particular, which I observed on the northern bank, had fruit upon it a foot in length and 3 inches in diameter, the seeds being good to eat. Another, with beautiful dark-green foliage, like an orange or laurel, bears a fruit also, which the natives described as very good, and a third bore a small plum. The large trees grow close to the river, and beyond them extends a dense thorny jungle, which was so difficult to get through, that we determined to leave four waggons and most of the oxen at a point about 90 miles from where we struck the river, till our return, and

thence went on to the lake in one waggon, belonging to Mr. Oswell, with some of the best of the cattle.

The Batouani live at the N.E. extremity of the lake. After spending a day with them we rode up about 6 miles S.W. to the broad part of the lake, which gradually opens out, like the Frith of Forth in Scotland, with an unbounded horizon of water in the direction we were riding. We can say nothing positively as to its extent. Its direction seemed to be N.N.E. and S.S.W. by compass. It is said to contain hippopotami, alligators, and large fish; but our visit was too short for seeing anything in or on it. It bends round to the W., and receives a large river from the N., at the N.W. extremity. The rivers which we did not see ourselves I have only noted in dotted lines upon the sketch.

The fact that the Zouga is connected with other large rivers flowing into the lake from the N. (where the people are said to wear clothes), awakens emotions in my breast which make the discovery of the lake itself appear comparatively almost of little importance; it opens the prospect of a highway capable of being easily traversed by boats to an entirely unexplored, but, as we were told, populous region. The hopes which that prospect inspires in behalf of the benighted inhabitants might subject me to the charge of enthusiasm—a charge, by the way, I wish I deserved—for nothing good or great has ever been accomplished in the world without it. I mean that feeling which impels with untiring energy to the final accomplishment of a good object.

All the rivers reported to the N. of the Zouga have Bayeiye upon them, but there are other tribes upon their banks. To one of these, after visiting the Batouani, we directed our course; but the Batouani chief managed to obstruct us by keeping all the Bayeiye near the ford on the opposite bank of the Zouga. African chiefs invariably dislike to see strangers passing them to tribes beyond. Sebitoané, the chief, who in former years saved the life of Sechele (our chief), lives about ten days N.E. of the Batouani. The latter had sent by us a present to him, as a token of his gratitude, which would have been a good introduction. The best, however, we can have is a knowledge of the language.

I endeavoured to construct a raft to pass over, where the river was only 50 or 60 yards wide, but the wood was so heavy, that it sank immediately. Another effort was equally fruitless; and, though I could easily have swam over, the landing in a state of nudity, as I must have done, to obtain the loan of a boat from Bakoba, would have been scarcely a becoming appearance for a minister of peace, setting aside the risk of an alligator meeting me on the passage. I did not, however, like to give up the attempt, but was finally dissuaded from it by my kind friend Mr. Oswell, with

whom alone the visit to Sebitoané was to be made, and who settled the matter by nobly offering to bring up a boat next year at his own expense from the Cape, which, after visiting the chief and coming round the N. end of the lake, is to become missionary property. To him and my other companion, Mr. Murray, I cannot sufficiently express my obligations. The chief expenses of the expedition have been borne by them.

I should mention, with reference to the sketch of the lake, that the position at the N.E. extremity, $20^{\circ} 20'$, where the Zouga issues from it, was fixed by an excellent sextant. The longitude is about 20° E. Our waggon stood near the Batouani town, whence we rode on horseback about 6 miles beyond, to the broad part. It gradually widens out into a frith about 15 miles across, as you go S. from the town, and in the S.S.W. presents an extensive horizon of water. It is reported to be about 70 miles in length, bends round to the N.W., and there receives another river similar to the Zouga.

The breadth of the Zouga, as laid down in the map, is to give an idea of the difference between its size after its junction with the Tamunakle and before it. It becomes narrower as it runs eastward. The course is shown by the arrow-heads.

The dotted lines running N. of the river and lake show the probable course of the Tamunakle and of another river which falls into the lake at its N.W. extremity. At that part marked by the name of the chief Mosing, it is not more than 50 or 60 yards in width, while at $20^{\circ} 7'$ it is more than 100, and very deep.

[Subsequently to the receipt of these letters from Mr. Livingston, making known the important fact of his having reached the great lake of N̄gami, a further communication has reached this country from Mr. Oswell, one of his enterprising companions, containing further particulars of the journey. This letter was read at one of the Society's evening meetings by Captain Vardon of the Madras army, to whom it was addressed, and although it of course contains much already made known by Mr. Livingston, the details are so interesting as illustrative of the difficulties of travelling in South Africa, as to be considered well worthy of publication without much curtailment—the more so, as the enterprising writer was at the date of his last letters again preparing to join Mr. Livingston, and to attempt with him to follow out the course of the Zouga, or any other river which may open, as they expect, a way to the Portuguese settlements on the Zambezi.]

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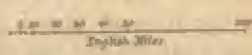
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Route of Messrs
Livingston, Oswell & Murray,
to
LAKE NĠAMI.
1849.

Water Stations in the Desert



Bakalihar
Desert

X.—*Extract of a Letter from WILLIAM COTTON OSWELL, Esq., of the Madras Civil Service to Captain Frank Vardon, of the Madras Army, regarding the Interior Lake of South Africa, dated Cape Town, January 10th, 1850.*

[Read April 8th, 1850.]

On the 10th of March I left Graham's Town for Kolobeng, with three waggons and five of my old servants, and, picking up horses as I went, *outspanned* at Colesberg for four weeks, waiting for Murray. *Inspanned* on his arrival (23rd of April), and reached Kolobeng on the 25th or 26th of May. The town stands in naked deformity on the side of and under a ridge of red iron sandstone—the Mission-house on a little rocky eminence over the river Kolobeng. Murray and I left it the day after our arrival, and, *trekking* (marching or proceeding) to a water called Shokuan, there halted for Livingston. The whole party left the water of Shokuan on the morning of the 2nd of June. To Mashué the road is much the same as other African roads—sometimes flat and open, sometimes bush and camel-thorn, and is besides the high road to the Bamanguato. From this we struck off at nearly N. as a general line, and journeying 40 miles over heavy sand ridges and flats sparingly covered with scrubby bushes, reached on the 3rd morning (having watered our oxen once on the way at Lobotani) a place called Serotli. I look upon this as the portal of the much-talked-of desert, and will therefore try to give you some idea of it. Imagine to yourself a heavy sandy hollow with half-a-dozen such holes or depressions as a rhinoceros would make by rolling himself as he usually does. In one of these stood about two pannikins of water, and at this spot, we were told, was the last chance of water for 70 miles (3 long days with a waggon). A quart is but short allowance for 80 oxen, 20 horses, and as many human beings. We had in coming thus far been once three days without water, but our oxen were quite fresh then, and rattled over 63 miles in style. But the natives, who busily engaged themselves immediately on their arrival with throwing out the sand from the little hollows, assured us that there was plenty of *metsé* (water) within. By the evening of the first day we had two pits opened, and sufficient to give the horses a bucket apiece; but as there appeared no chance for the oxen until more pits were opened (nor even *then* if the water did not flow in more quickly than it was doing), we determined to send them back 25 miles to Lobotani, to remain there until we could ascertain whether the supply could be made to equal the demand. Late on the morning of the 5th day the poor brutes reached their drinking place, having been 4 full days (96 hours) thirsting. The horses remained with us,

for we foresaw a sufficiency for them, and a deficiency of food for ourselves without them. The holes we had emptied the preceding evening were considerably fuller the next morning, and this we afterwards found invariably the case: time seemed to be required for the water to clear its way through its sandy bed. The oxen returned from Lobotani on the 5th day, after a variety of mishaps which I will tell you some day when we meet—they are not worth writing. We had a good supply of drink ready for them, and letting them have it at once, we inspanned, but, what with the heat and the sand, could make but 6 miles by sundown. The next night, with a little application of the whip, we reached a spot called Mokālāni (the camel-thorn trees). Our trocheameter told us we were 25 miles from the Serotli pits, and our guide seemed to hint that, if we went so slowly, it was a matter of doubt whether we reached the next watering place at all. It will be long if I ever forget this night at Mokālāni. We were fairly away, and no one, I really think, would have turned back for any consideration; but the anxiety as to whether we should accomplish our intentions or not was pretty strong within me at all events. The want of any knowledge of the road, save that it was by repute very heavy and nearly waterless, coupled with the difficulty with which the oxen had dragged the heavy waggons through the sand on the preceding day, greatly tended to increase this, and, regarding the poor brutes as the means through which I was to gain my point, they were objects of constant care; for I had determined, if possible, that my waggon should take me there.

After breakfast, on the 2nd day from Serotli, the horses were sent on ahead with our guide: *they* could travel faster than the oxen, and might come to water the latter would never live to see. We followed on their trail, which led for the most part through dense bush and heavy sand. Whips and screeching could get but 19 miles out of the poor beasts; they were beginning to feel the want of water sadly, for although hardly two days without, it had been no colony travelling over hard roads, but right harassing work. 44 miles had been accomplished with *great* difficulty in 21 hours! Murray was with the horses: Livingston and myself had remained behind. The dinner-party was not a merry one, for the members were all too well aware that the poor bellowing beasts around them could not drag on the waggons *very* much farther, and the next spring was believed to be still some 30 miles in advance. We determined to go on as long as the animals were able to work, and then send them on. Half an hour in the morning brought us to the edge of the thicket in which we had passed the night, and upon entering the hollow immediately beyond, the steeds came into view. Was it water? No. The guide had lost his way in this pathless wilderness, and Murray very rightly had

halted at once. With the sun our guide's perceptions seemed to brighten, and he again walked confidently forward. Eight miles were hardly crawled, when the waddling gait of our oxen warned us to outspan. The natives said they would follow the little path we had been coming along, as long as it led in the right direction, in the hopes of finding what we stood so much in need of. It appeared afterwards that they had been told of a small marsh, and of this they now went in search. Breakfast was not over when one of them returned with the intelligence of a large pool close at hand. The oxen, which ten minutes before had been considered as all but exhausted, were now yoked at once. Two miles brought them to Mathuloāni. On Wednesday we had quitted Serotli—it was now Saturday. Giving our cattle Sunday's rest we again proceeded, though with no very distinct idea when we were to see water. Our guide indeed assured us that even our horses would never thirst more; that we were in the bed of a river, though *we* did not perceive it; but we knew the old fellow's notions of the distance a waggon could travel were rather vague—the marsh we had just drunk at too was a godsend he never calculated on, and how far it still was to Mokokonyani (the first *certain* water from Serotli) was a mystery. For the four first days we fared well enough, finding on the 1st and 3rd a sufficient supply of rain-water, and on the 4th reaching the *first* surface-water in Mokokoong* (the river of the guide) at a place called Mokokonyani, signifying "my little brindled gnou."

After leaving Mathuloāni we had followed the course of this said sand river, which presently became defined enough, but was to all appearance dry. It, however, yielded us an abundant supply, though not without considerable labour in the way of digging. At Lotlokani (another small spring in the Mokokoong, 3 miles from Mokokonyani) we left the river, and touching it once again on the morning of the second day left it where it spreads out into a large lagoon-like marsh now dry. Beyond this our pathfinder wandered a second time, and had I not captured a Bushwoman whom I saw skulking off in the long grass I am not quite sure we should have reached our goal so well as we did.

* These sand rivers are puzzles to me. Water has evidently, from the height of the banks, *once* flowed in them, but *when* and *why* has it ceased to do so? It still runs under the surface. Dig to a certain depth, and, as far as I know, you invariably find it: but never *on the surface*, except in a few particular spots where the limestone appears above the sand and there is a spring. The Mokokoong is but a fair specimen of a class; there are many such to the westward. The whole desert, so called, from Serotli to the Zonga, partakes of the character of its rivers, inasmuch as it has no *surface-water*, but innumerable sucking-holes, which supply the Balala and Bushmen. The Serotli pits are a good specimen of the whole. A reed is sunk two or three feet down in the sand, and the water drawn up by the mouth. I have tried it, and found it come readily and abundantly; but I shall take up small pumps next time with me.

We had been 2 full days without water, and were going in any but the right direction when I discovered her. A few beads and mortal terror induced her to confess that she knew of a spring, and offered to conduct us thither. After passing through a very thick belt of trees we came suddenly on an enormous saltpan, or rather succession of saltpans. It was evening, and the setting sun cast a blue haze over the white incrustations, making them look so much like water, that though I was within 30 yards of the edge I made sure that I had at last reached "*The Lake*," and throwing up my hat in the air, shouted till the Bushwoman and Bakuains thought I was mad. I soon discovered my mistake—many made it after me. By the side of the first pan was a small spring of very brackish water. Our oxen reached it next morning. From this point towards the W.N.W. and N.E. we could see dense columns of black smoke rising, and were assured that it was the reeds of the lake on fire! Little thought we that the lake was still some 300 miles from us. Livingston and myself had been climbing up the little hillocks in vain to get a "first view" for the last 3 days; but all doubts of seeing it eventually vanished on the 4th of July, when riding out from our night's resting place a little beyond Chakotsa to search for a path, we came upon the *real water* river (the Zonga) running, as we struck it, towards the N.E. A village was nearly opposite us, and we were naturally anxious to open a communication—the people had all made over to the other side. I tried to drive my horse through a place that looked like a drift, but got him swamped and very nearly lost him. Livingston and two of the Bakuains managed to get through, and we were gladdened on their return by the news that the water we saw came from that of which we were in search, the Great Lake. We felt all our troubles were over, and next morning, when our waggons stood on the banks of the Zonga, all anxiety for the result was at an end. We might be a long while; the natives said a moon; but we should at last see the broad water, for we had a river at our feet, and nothing to do but to follow it. I shall mention this river again presently, so I will not detain you on it now. We followed it up stream for 96 miles from the point at which we struck it, and were then told that we were still a considerable distance from the Lake. Our oxen were getting tired, and could make but short journeys with such heavy loads. Emptying my waggon, therefore, and selecting a span from the freshest, we determined to make a push for it. Leaving the other waggons and the remainder of the cattle with the greater part of the servants, we started on the 16th of July, and after 12 hard days' work arrived at the half tribe of the Bamanguato, who call themselves Batouani. We outspanned nearly abreast of the town at the lower end of the lake.

A tongue of land or an island, I could never discover which, jutting out in a peculiar way, and sand ridges prevented us from getting a fair view of the water where our waggon stood, so we mounted the horses and rode 5 or 6 miles along the bank, and then I was fully, fully satisfied, and more than repaid. One broad sheet of water lay before us. To the N.W. and W. you looked in vain for shore. To all appearance in those directions it was boundless as the ocean. Straight across, that is N.N.E. from where we were standing, the shores were, as we thought, about 14 miles apart. The eye could follow their tracery for a short distance to the N. and N.N.W. Towards the E. they continued slowly but gradually approaching each other, and contracted suddenly just at the place where the waggon stood. What was an expanse of water 8 miles across, is now just below but a moderately broad river (say 200 yards). The bank on which we stood was very flat; probably the opposite one may be so too, and therefore not visible at any great distance. Of the actual breadth I of course can form no correct notion. The canoes never *cross* it, but some coast round and along the shores. Of its extent we may perhaps arrive at an approximation from the accounts of the Batouani, who assert that a man walks 2 days (50 miles) along its bank to the S.W., 1 day (25 miles) to the N.W., and then finds the lake a river coming from the N.N.E. We were obliged to be content with hearsay, and so must you for the present.

One of the great objects of Livingston's coming up (the visiting a great chief, by name Sebitoané, supposed to live some 200 miles to the N.N.E.) was yet unaccomplished, and the season very far advanced. I determined to be Livingston's companion, taking the horses, and sending back the waggon. The fates, however, were against us: everything looked well at first, but somehow the natives got alarmed, and unfortunately the Zouga was to be crossed. We reached the proper spot for the transit, and not a canoe would show itself on the right side. Livingston tried for a whole day to make a raft; but the worm-eaten camel-thorn sank as quickly as he put it in the water. At last we gave it up till next year, when, please God, we will be more successful. We were now a long way from Kolobeng, and the season so far advanced, that we thought it better to make our way back, and leave further examination for another trip.

During the expedition some of our day's journeys were short enough, often not more than 10 miles; but the work was nevertheless hard from the thickness of the jungle and the heavy sand. In one $5\frac{1}{2}$ mile stage upwards of 100 trees were cut down, from the size of my arm to that of a blacksmith's—the distance took $6\frac{1}{2}$ hours to accomplish. Another heavy sandrise, thickly covered with bush of about $1\frac{1}{2}$ mile in extent, kept us for 2 hours. I was on this

occasion just ahead of the waggon trying to find the most practicable line, and very often could see nothing but the fore oxen's heads, and knew not by sight where the vehicle might be, till all at once I would behold it tearing its way through the thicket. A small dwarf thorn-bush also caused us no inconsiderable annoyance, tearing the noses and legs of the oxen, and preventing them from pulling together.

The Noka a Batlatli—Noka a Mampooré—N̄gami—Inghabé (for it has all these names), is situated in 20° 19' S. lat., and about 24° E. long., at an elevation above the sea of 2825 feet. The latitude you may consider correct. The longitude, in consequence of our having no watch that would go, is merely worked out by courses and distances. The height is an approximation *only* as ascertained by one of Newman's barometric thermometers.

The distance traversed from Kolobeng was 603 miles, measured by a good trocheameter. Kolobeng is about 570 miles from Colesberg, or 900 from Algoa Bay. Now that we know the "short cuts," we might perhaps make the journey in 550 miles; but we came upwards of 600. The direct course would be N.W. from Kolobeng, but there is no water for a waggon: men walk it after rains.

The Batouani have no communication with the Portuguese. The only other large tribe on the Lake, of which I learnt the name, was the Maclumma, of Damara descent I fancy. Sebitoané is said to live in one of the tributaries of the Tamunaklé, which flows into the Zouga. His country is called that of "large trees," or "many waters."⁵ He *has* communication with the Portuguese; but through another tribe, *not* direct. Don't you envy me my trip in perspective? The S̄etsé* is spoken of in particular spots; but as the chief is a kind of Moselekatsé of the west, and very rich in oxen, they cannot, I should suppose, be spread over any large tract.

A few words on the Zouga, its inhabitants, &c., &c., and I have finished. Its course is, as you see at first, nearly E., then S., S.E., N.E., and E.N.E. From two or three days from the Lake it is broad, varying from 200 to 500 yards, with flat and rather swampy shores. It then narrows and flows through high banks of limestone for 6 days—again opens out, and at its most southern point spreads into a little lake 4 miles or so across; then divides into two streams, one of which (the most southerly) is said to lose itself in the salt pans to the eastward, while by far the largest branch, on the authority of the natives, runs away N.E. and E.N.E. through the country of the Matabélé. I should mention

* The fly to which the name of *Glossina morsitans* has been recently given.—Ed.

that all this part of the banks of the river, so far as we saw it, is excessively thickly edged with high reeds, and bears evident marks of inundations. May it not take a bend S.E. and unite with the *Limpopo*? For the first 10 days the banks are very picturesque: the trees (most of them unknown to the Bakuains) magnificent for Africa: indeed the Mochuchong, one bearing an edible fruit, would be a fine specimen of arboreal beauty in any part of the world. Three enormous Morlwānahs* grow near the town of the Batouani: the largest is upwards of 70 feet in girth; but they are not common. The Palmyra is scattered here and there amongst the islands, and on the banks of the Zouga, and is abundant along the Mokokoong (the sand river of the desert). In appearance it is exactly the same as our Indian ones; but bears a smaller fruit. I have brought some down with me. A tree very like the smaller Banian of India grows on the bank of the river. The natives said it had occasionally "drops;" but I did not see any. It would seem, however, to have some kindred affinity to the Indian one; for in places where a branch had been taken and bent downwards, I noticed that it had frequently shot up again. Wild indigo is abundant in places. The Makalakka or Mashūna (I think them to be the same) do really make cloth, and dye it with this blue.† Don't you remember our being very sceptical on this point? They use the cotton of two kinds of bushes and one tree—the latter is of inferior quality. The Bakoba are the principal dwellers on the islands and banks of the river, though there are a few scattered Bushmen and Baharootzi kraals towards the lower end, where we struck it. The word Bakoba means slave, and is only applied to them by others, they styling themselves Bayēiyé, that is pre-eminently men. They are fine intelligent fellows, much darker and larger than, and in every respect superior to, the Bechuanas. Their language is distinct with a click; but not Bush. They must come from the Damara side I fancy. They are not by any means confined to the river Zouga; but "fish and float," as Livingston's letter says, in all the neighbouring waters. Their canoes are but roughly fashioned out of whole trees, and so that one end can be made to counterbalance the other, they do not care whether they are straight or not. Many of them are quite crooked. Paddling and punting are their only means of progression; sailing is unknown. They live chiefly on fish (that abomination of the southern Bechuanas), which they

* Baobab (*Adansonia digitata*) in all probability. From the Niger down to Benin, and so no doubt southward to the Tropic, where it ceases. (*Vide Saturday Magazine*, Oct. 27, 1832.)

† A specimen of this cloth was produced by Captain Vardon at the meeting of the Royal Geographical Society, together with the enormous tusks of the S. African wild hog, the flat head of the large fish, and the fly (*Setsé*) so dangerous to the cattle. The two latter are considered *new*.—Ed.

catch with very neatly made nets, manufactured from a species of wild flax. Their float-ropes are made of a flag, and the small floats on the nets of a kind of reed with joints, so that, although one become saturated, the others still remain buoyant. I have pieces of rope, net, twine, hemp or flax, which you shall see some day. To prevent their rotting, the nets are dyed with a tan prepared from the bark of the camel-thorn. The Baharootzi have no canoes or nets, but spear fish with the assegai, standing on rafts made of bundles of reed tied together. The fish are in great abundance, and of immense size, our old Limpopo flathead among the number. The Baharootzi, Bakoba, and Bushmen have also another way of providing themselves with food, hardly so unobjectionable in my eyes. From end to end the banks of the Zouga are lined with pit-falls. Eleven of our horses fell in—one only died however; but two of the oxen managed to bury themselves—fortunately we had a few spare ones. We ourselves were all caught—the trader twice or thrice in the morning whilst searching for and opening the holes to prevent mishaps amongst the cattle. They are most artfully concealed: loose sand is sometimes thrown over the covering reeds and grass, and the impressions of animals' feet, together with their dung, placed at top. They make the game very wild. One animal falls in and alarms the whole herd. They retreat far off, and only return again to drink and flee. From the elephant to the steinbuck nothing escapes. We had hard work enough without much hunting; but I have killed some fine bull elephants. These and buffaloes are abundant—rhinoceroses and other game (except in one or two particular spots) very scarce. Hippopotami are so hunted by the Bakoba, that they hardly ever show themselves. The elephants are a distinct variety from the Limpopo ones; much lower and smaller in body (10 feet is a large bull), but with capital tusks. I saw two quabābas (straight-horned rhinoceroses)—wounded one, but did not bag him. Eight or nine '*léché*'* fell. Piet (my waggon driver) shot the first—Livingston the second—Murray the third. The horns of the *léché* are very much the same as a male waterbuck's, and his habits are precisely similar. Two other species of antelope are mentioned by the natives—one we saw; something of the koodoo kind, but lighter and smaller—the other is yet to be seen. Lions are very scarce along the river and by the lake. We never heard them but once, and at one time used occasionally to let our oxen run loose at night. The day however that my horse fell into the pitfall and died, we found there *were* such things. The trader rolled one over and I the

* The new antelope, recently discovered in South Africa, the skin of which has been forwarded to this country by Mr. Oswell, and presented to the British Museum by Captain Vardon.—Ed.

other, rather disgracefully it must be allowed, from a tree; but had we been particular as to our honour, we might as well have left them alone, for we could never have seen them for the bush. I slew two others, and this was the whole of the bag, though I never missed but one chance, and that was from being greedy and trying to make too sure. The only thing like an escape I had was with the first. We had lost the road coming into Kolobeng, and, cantering along through some rocky hills to look for it, I heard a grunt behind me, and, turning round, saw a lion within 8 yards of me in full chase, head and tail up. My old hat, torn off by a tree, and a shot Parthian-wise satisfied him till I had got 50 yards ahead. I then jumped off, with the intention of loading the empty barrel, and bringing my friend to account. My foot was not clear of the stirrup when he was on me. *This* time I was on the look-out for him, and a lucky shot dropped him amongst some low bushes and masses of rock, about 15 or 20 yards from where I stood.

There is now a great point to be ascertained: namely, whether it be not possible to reach the Portuguese settlements on the Zambezi by an overland route. I hope to do something towards elucidating this, and have therefore made up my mind to leave Cape Town towards the close of the present month. I have letters of introduction to the Portuguese authorities should I happen to fall in with them, and anticipate no danger from the natives. We shall not, in all probability, reach the stations on the Zambezi, but we may be able to prove the possibility of subsequent travellers doing so. Livingston will accompany me.*

XI.—*Copies of Reports from Captain Thos. Henderson and Commander S. A. Paynter on Coal Formations in the Straits of Magellan, &c.* Communicated by the Admiralty.

[Read March 11, 1850.]

H.M. St.V. Sampson, Rio Janeiro, October 22, 1848.

I, SIR,—I HAVE the honour to acquaint you that, in compliance with orders from Rear-Admiral Hornby, I obtained at Port Famine, by the kindness of the Governor, a guide to conduct me to the veins in the neighbourhood of Punta Arenas (Sandy Bay), and having anchored there on the morning of the 8th instant, I landed with Mr. Barrowman, 2nd Engineer of the "Sampson," and proceeded to the first vein about 7 miles distant from the bay, situated

* For an account of Mr. Galton's expedition to the Lake see President's Address, p. xxxvii.—Ed.

on the N. bank, and 40 or 50 feet above the level of the river. The vein is 30 or 40 feet in depth, about 20 feet of which could only be got at for the snow; but all that was visible appeared to be clean and of good quality, and may be worked with great ease.

The road as far as the commencement of the first ridge of hills from the bay, or about 4 miles, lies over a perfect level; the remaining portion of 3 miles passes over several ridges of hills, and, when it reaches as high as the first vein, descends over a deep brow to the head of the river, gradually narrowing to a footpath.

The second vein is a mile farther than the first, and the third a mile and a half beyond the second. Both were entirely covered with snow. They are represented to be quite as good as the first vein, and also close to the level of the river.

Having secured specimens of the first vein, and finding the principal difficulty attending the working of the mines would be the want of a good road, I returned to the shore by the bed of the river, to ascertain how far it might be practicable to take advantage of its level for the construction of a road to avoid that part of the present one over the hills; and although I found the river very tortuous, I saw no great difficulty in forming a road along its banks to join that of the plain, there being abundance of material, wood, and stone, on the spot: some of the trees measuring 3 and 4 fathoms in girth.

The bed of the river is filled with pieces of good coal, which must have fallen from the veins on its banks; and as these deposits are numerous, it may be assumed there is plenty of coal in the neighbourhood. I observed also indications of metallic substances at the bottom of several tributary rills and rivulets. The veins have not been worked, nor are there any appearances of their being so by the Chili Government, which has only established Punta Arenas as an outpost, under the command of a Lieutenant.

No reliance can be placed on a supply of coals there until a road be constructed and means of transfer from the mines to the bay secured, as it was only with great difficulty that I reached the first vein by the hill-road, which was deeply covered with snow.

I shall leave specimens of the coal for your inspection,* and have the honour to be, Sir, &c. &c. &c.

* These specimens have been analysed at the Government Museum of Practical Geology, and declared to be good varieties of the fossil fuel called Brown Coal or *Lignite*. Other specimens from Talcahuano Bay and Colcurra Bay, Chili, appear to be real coal of the variety known as Cannel or Candel Coal; while that from Vancouver's Island resembles ordinary Newcastle Coal, containing, however, a superabundance of earthy matter.—Ed.

H. M. St. V. Gorgon, Valparaiso, September 24, 1845.

2. As I was directed by Commodore Sir Thomas Herbert, at Monte Video, to examine the neighbourhood of Laredo Bay for coal, I, in company with several officers, explored for three miles round the bay, and observed no indication of surface coal, or any appearance on the rise of the hills or falls of the valleys to indicate a coal formation; on the contrary, the land we passed through was a continued swamp in one direction for miles, and the hills were covered with a stunted growth of small winter birch, and a few evergreens and shrubs. The streams that run in numerous directions from the neighbouring hills come untinged and perfectly clear to the sands, and it is therefore my impression that in the immediate vicinity of the bay there are no veins of coal.

Laredo Bay is a very good anchorage, but the N.W. side is to be preferred, as it has a good sandy bottom. On the 17th of August at daylight I left Laredo Bay for Port Famine, in which neighbourhood I was also directed to look for coal, samples of which had been sent home in the "Salamander." As it was necessary to wood ship, and to obtain accurate information of any coal, I communicated my instructions to the Governor, and by himself and Mr. Dunn, his Secretary, was informed that there was no evidence of coal being in the immediate neighbourhood, but that at Sandy Bay, which I had passed, and which was distant from Port Famine 30 miles, there were coal-mines. These were four or five miles in the interior, and could by proper appliances be easily made available for the use of steamers, but that no attempt had been made to work them, as there was neither capital nor demand. They did not know the extent of the veins nor their probable direction, but from the appearance of the surface-coal they were led to believe in the existence of extensive beds. I visited the neighbourhood of Port Famine, but saw nothing to indicate the existence of coal-beds, and the jungle was almost impenetrable on the hills, which shot up from the shores of the Bay. In the different trips the officers of the colony had taken, no signs of coal had fallen under their notice, although they were naturally anxious to discover it, as it would render the colony more valuable to Chili. I therefore considered it was useless to steam back and lose a week in exploring a district already well known to the colonists, from whom all necessary information could be easily obtained by vessels passing eastward.

XII.—*Remarks on the Country between Wady Halfeh and Gebel Berkel, in Ethiopia, with Observations on the Level of the Nile.*
By Sir G. WILKINSON, F.R.S., F.R.G.S.

[Read November 24, 1849.]

To the Secretary of the Royal Geographical Society.

Lucerne, June 28, 1849.

SIR,—In presenting to the Society the following remarks on the country between Wady Halfeh and Gebel Berkel, I must not omit mentioning my obligations to Cailliaud's Map, and that I have seldom found reason to differ much from that indefatigable traveller, either in his geography, or his general remarks respecting the country.

The rocks in the bed, and on both sides of the Nile from Wady Halfeh, or the second Cataract, as far as the Isle of Sai, are primitive, mostly granite and trap; the valleys are frequently wild and picturesque, amidst mountains not less than 800 or 1000 feet in height; and about latitude 21° appear some isolated mountains of sandstone, rising abruptly from the plain, and showing in a very interesting manner the junction of the primitive and secondary formations.

Similar isolated hills continue at intervals throughout the whole tract from that part to the province of Dongola, of no great elevation, seldom exceeding 400 feet; but so deceptive at a distance, that they appear at least three or four times that height. At Allandûli, on the desert opposite Sai, are numerous Egyptian pebbles, ranged upon the low graves of the Moslems, in humble imitation of the broad circles of black and white stones, on the tumuli of their pagan predecessors, which have been collected and brought to the spot for that purpose; and a little to the S. of this is a bed of fine grit, lying over sandstone, and full of pebbles, decomposed here and there, and showing how that stratum has once more been reduced to sand, and has left the hard pebbles alone on the surface of the rock immediately below it.

Soon after this the primitive schists, quartzose and trap rocks reappear, and continue (with some sandstone above them, about el Kedáyn) to the summit of the pass over the mountain plain that terminates the district of Dar Mahass. Here again, Gebel Arambééh, and other isolated secondary hills, stand upon the granites; and these last, rising at length only a few feet above the surface of the plain, disappear just beyond the frontier of Dongola, and are not seen any more till the neighbourhood of Nooree, the whole of that part of Ethiopia being sandstone, on both sides the river, and Gebel Berkel itself being a coarse grit, very like that

of the "Red Mountain," near Cairo, which lies upon the limestone of the Mokuttum.*

It is to beds of grit, and recent sandstone, lying over the older sandstone in Ethiopia, that the Egyptian pebbles and petrified wood have once belonged, layers of which are found upon and under the alluvial soil at the side of the Nile, about Ordee, and other places in Dongola, having been brought down by the river from the upper country; and it is evident that they appertain to the same kind of formation, which once contained within it the petrified wood (of the so called "forest") now lying exposed above the limestone of the Mokuttum, as well as on the summit of the Libyan hills near the Natron Lakes.

The journey to Ordee, the present Turkish capital of Dongola, is generally made by the West bank, being much shorter than the Eastern road, owing to the many corners it cuts off; but it is far less interesting, being mostly a dreary waste of sand, intensely hot in summer, and equally cold in winter, when the N.W. wind sweeps the great expanse of the African desert. Narrow as is the strip of cultivable land on the east bank, that on the west is still smaller; and even the desert plants are wanting, which grow in the valley on the Arabian side; at least until you reach the dreary and monotonous plains of Dongola. The principal plants on the east bank (which are also among those that grow in the Maazy and Ababdeh deserts, east of the Nile) are the Senna; the Hargel (*Cynanchum Argel*), well known like the Senna for its medicinal properties, and remarkable for the fragrance of its white clustered flower; the Ösher (*Asclepias gigantea*); the Ghulga (*Periploca secamone*); some coarse grasses; a few Colocyths; the Merkh (*Cynanchum pyrotechnicum*); the Tónthob (*Sodada decidua*); the Tarfa and Athul (*Tamarix Gallica* and *T. Orientalis*); and numerous Sellem, Harráz, and other *Mimosas*, some of which are fine timber trees.

The few cultivated productions are cotton, indigo, dokhn or millet (*Phaseolus mungo*), some lupinus and gilbán (*Lathyrus sativus*), very little barley, and Doora (*Sorghum vulgare*), and no wheat except in the Dar Shaykeeh. But palm-trees (*Nakhl*—*Phoenix dactylifera*), which are so valuable for their fruit and timber, are numerous; and the dates of Sukkôt are famed for their excellent flavour, superior even to the Ibreemee, or to those of Korayn. The Dôm or Theban palm-tree (*Hyphæne Thebaica*) is rare: indeed it grows more abundantly in Upper Egypt than in any other place, and it is one of the few instances in which a specific name has been properly taken from a particular district. The *mimosas*

* See more fully, on the geology of Egypt, Russeger's 'Reisen in Europa, Asien, und Afrika;' also Lieut. Newbold, F.R.S., 'On the Geology of Egypt,' etc., in the Journal of the Geological Society, vol. iv. 1848, p. 324.

and the *Ösher*, however, thrive in Dongola; and even the seemingly useless wood of the latter is turned to many purposes; but it possesses no beauty, and only seems to increase the dismal aspect of the desert plains or uncultivated lands of Dongola; after which the better cultivated and more productive fields of the Dar Shaykééh are a relief. In two or three places I met with *Salvadora Persica*, and a variety of the Nebk (*Rhamnus Nabeca*), but that province is not remarkable for the number or variety of its botanical productions.* Yet the plains of Dongola, like many other portions of what is now the desert, were once highly productive, having been annually watered by the rising Nile; and many valleys and level spots, sometimes extending to a considerable distance from the river, were once within the reach of the inundation.

This change I suppose to have taken place between 3350 and 3550 years ago; when an earthquake, or the force of the water, having broken down the high barrier over which it till then had fallen at *Silsilis* (*Hadjar Selseleh*), in Upper Egypt, the level of the Nile was lowered between 30 and 40 feet throughout its whole course above that spot, and thenceforward ceased to inundate the very soil it had annually deposited in Ethiopia.

In that country it now falls short by about 28 feet of its former level, during the inundation; the inscriptions at *Samneh*, recording its annual height during the reigns of ancient Egyptian kings, who reigned from about 1700 to 1500 before our era, stand from 27 feet 8 inches to 28 feet above the highest Nile hitherto known, that of 1848; and extensive fields of old alluvial deposit, sometimes of many miles in length, and often from a quarter to 2 or 3 miles in breadth, with the additional evidence of water-worn rocks, are met with in numerous places above the second cataract.

In Nubia also, the same old alluvial deposit is traced far above the reach of the present inundations; and the same continues a little below Asouan, as far as the neighbourhood of *Silsilis*, from which I have been led to the conclusion that at *Silsilis*, and not at *Asouan* (as I first supposed), the bursting of the barrier took place, which had till then maintained it at its higher level.

Another effect of this sudden opening of a lower channel was to prevent the Nile from following the course it formerly held, down the valley lying to the east of the town of Asouan, and which, from the alluvial deposit I found in its bed, was evidently once the course of the river. A similar dry channel, 3 miles long, has been left at Egger, and another at Wady Absout, in the Dar Mahass; and the same evidences of the ancient level of the Nile may be traced throughout its course in Ethiopia.

* For these botanical productions see Sir J. G. Wilkinson's Second Series of 'The Manners and Customs of the Ancient Egyptians,' vol. i., chap. 11.—H. S.

I have already had an opportunity of treating this more fully in a communication lately sent by me to the Royal Society of Literature; and as I wish to leave room for some observations made in Egypt with the Aneroid barometer, I hope this will plead my excuse to the Society for noticing the subject so briefly on the present occasion.

Professor Chaix of Geneva has already submitted to the Society the result of his observations with the barometer in Egypt, and has given, among other valuable information, a calculation of the fall of the Nile from Philæ to the Mediterranean: it may therefore not be uninteresting to compare the following observations with those of the Professor, at the same time that they afford an opportunity of testing the value of that very convenient and sensitive instrument the *Aneroid* barometer.* They are made on going from Atfeh (at the junction of the Alexandrian Canal with the Nile) to Gebel Berkel, and on returning from the latter place to Alexandria, so that the gradual variation during the two seasons of the year may be ascertained and allowed for; but owing to the space they necessarily take up in a letter, I will refrain from adding my calculations on the fall of the Nile during its course, which are of less importance, as any one who feels sufficiently interested in the subject can supply this omission.†

SELECTION, by Mr. FRED. AYRTON, from Sir GARDNER WILKINSON's Record of 552 Observations made by him with an ANEROID BAROMETER (of Messrs. Arnold and Dent) between Alexandria and Gebel Berkel; consisting of such of the Observations as were made under the most nearly corresponding Atmospheric Conditions of Wind, &c., and at the times most nearly corresponding to that of the Sun's passing the Meridian.

Date.	Hour.	Place.	Aneroid Barometer.*	Thermometer, Fahr.	Wind.	Distance by River.†	REMARKS.
1848.			Inches.	°		Miles, St.	
Oct. 24	2 p.m.	Atfeh	29.880	80	N.E.	..	Light wind, clear.
	12 noon	Mehallet Ali . . .	29.863	82	N.W.	14	Very calm.
25	12	Abou Nishâbeh, . .	29.825	80	..	67	Cloudy.
26	24 p.m.	Old Barrage of the Nile.	29.785	81	..	..	Very light wind, clear.
30	12 noon	Cairo	29.750	75	W.	46	Clear, few clouds.
Nov. 1	14 p.m.	Ditto	29.825	74	N.W.	(Doulak)	Wind sometimes light, sometimes stronger, never violent; on land about 80 feet above the river.
4	1 ..	Ditto	29.800	74	..	..	Showery.

* The indications of the Aneroid Barometer are supposed to represent the atmospheric pressure in inches of mercury.

† The distances as far as Philæ have been measured off on the large French map; those between Philæ and Gebel Berkel from Cailliard's 'Cours du Nil,' and are taken along the line of current of the river.

Selection, &c.—continued.

Date.	Hour.	Place.	Aneroid Baro- meter.	Thermo- meter, Fahr.	Wind.	Distance by River.	REMARKS.
1848.			Inches.	°		Miles, St.	
Nov. 11	8½ ..	Kafr el Aiat	29.745	73	W.	34	Light wind, clear.
12	2 ..	Between Beni Socef and Isment.	750	74½	N.W.	44	Ditto, ditto.
13	2 ..	Gebel Sheikh Um- barak.	740	73	..	20	Ditto, ditto.
15	11½ a.m.	Beni Hassan	770	71	..	62	Ditto, ditto.
20	½ p.m.	Osioot, by landing- place of El Hamra	730	74	..	80	Ditto, ditto.
23	12 noon	El Rahineh	680	69	..	28	Ditto, ditto.
24	10 to 2 p.m.	One m. N. of Girgeh	710	70	..	50	Very strong wind, clear.
25	½ p.m.	El Bekkharres . . .	710	69	..	24½	Calm, clear.
Dec. 3	2½ ..	Laxor	660	79	..	78	Ditto, cloudy.
5	½ ..	S. of Gebelagen . .	550	74½	..	24	Light wind and calm, cloudy.
..	1 ..	Metana	545	76	..	..	Strong wind, clear.
8	11½ a.m.	To S. of El-Hegs* .	525	63	..	..	Rather windy, ditto.
11	1½ p.m.	1 m. S. of Ombos* .	550	69	..	86	Gusta, ditto.
12	11½ a.m.	Asuan	650	70	..	23½	Light wind, ditto.
14	½ p.m.	In cataracts	555	67½	..	3	Ditto, cloudy.
15	11 a.m.	Phila	610	69	..	4	Ditto in pass, ditto.
16	11 ..	Tayfee †	615	70	..	..	Light wind, few clouds.
..	1 p.m.	Kalátshee	550	68	..	24½	Ditto, ditto.
17	11½ a.m.	Below Kostiánne ‡ .	590	68½	W.	19½	Ditto, clear.
18	1½ p.m.	Bardes	550	68	..	32	Calm, few clouds.
19	6½ ..	Below Abul-el- Kereem.	550	72	W.N.W.	..	Gusta, ditto.
20	2 ..	2 m. N. of Amáda Temple.	515	72	N.W.	..	Ditto, clear.
21	12 noon	Derr	510	78	..	37½	Calm, ditto; reflected heat, but in shade.
22	2½ p.m.	1 m. N. of Ebreem .	430	76	..	13½	Ditto, ditto.
24	2½ ..	Gazeerit Farra . . .	425	67	..	34½	Strong wind, ditto.
26	11½ a.m.	Wady Halfeh † . . .	585	62	..	21	Very strong wind, ditto; 15 feet above surface of river.
1849.							
Jan. 8	2 p.m.	Opposite Ordes . . .	28.880	} 60 {	..	} 257½	High wind.
11	1½ ..	Ordes, on River . . .	29.000		..		
12	2½ ..	Goled	28.990		..		Much wind.
13	11 a.m.	Meseriké	29.020		..		Strong wind; fog of sand.
..	2½ p.m.	Kooree	28.990	70½	..	69	Strong wind.
14	1 ..	El-Hegayr	29.035	64½	..	90½	Ditto, cloudy.
17	11½ a.m.	Between Kooree and Gebel Berkel.	29.063	66	..	..	Ditto, ditto.
..	2 p.m.	Merrawee	29.070	67½	..	10½	Ditto, ditto.
23	2 ..	Gebel Berkel	29.120	72	..	8	Ditto, clear.

* At Silsilia, between El-Hegs and Ombos, the temperature was—

At sunrise, of the water of the Nile, Fahr. 65°; of the air, in the shade, 62°	
10 a.m.	63
Noon	68
2½ p.m.	66
5 p.m.	67
8½ p.m.	68
† At Tayfee—	
11 a.m.	65
‡ At Maréeb—	
7½ a.m.	64
At Kostiánne—	
Noon	65
1 mile N. of Dakkeh—	
5 p.m.	65
At Korth—	
10 a.m. to 2 p.m.	64
§ At Wady Halfeh—	
8 a.m.	62½

Selection, &c.—continued.

RETURNING FROM GEBEL BERKEL TOWARDS ALEXANDRIA.

Date.	Hour.	Place.	Aneroid Baro- meter.	Thermo- meter, Fahr.	Wind.	Distance by River.	REMARKS.
1849.			Inches.	°	Inches.	Miles, &c.	
Jan. 23	14 p.m.	Zoma	28.920	71	N.W.	..	Dead calm, clear, cold.
27	11½ a.m.	1½ mile above Old Dongola.	29.185	65	..	93½	Rather strong wind, clear.
28	4 p.m.	Khandek	*140	73	..	32	Ditto, ditto.
29	2½ ..	Ordee	*090	82½	..	40	Calm, clear; the Nile had fallen at Ordee 1 ft. 8 in. since the 10th of January.
30	10½ a.m.	Ditto	*095	67	..	..	Calm, clear.
Feb. 13	1½ p.m.	Ibreem	*482	64	..	332	Light wind.
15	11½ a.m.	Dobek	*590	62½	..	55½	Strong wind.
16	1 p.m.	Maharraka	*484	61½	..	92	Lighter wind.
17	1½ ..	Dandoor	*490	66	..	284	Strong wind, but de- creasing.
18	1 p.m.	Kalibabeh	*540	65	..	92	Strong wind; very cloudy.
19	11½ a.m.	Idhm "	*575	60	..	234	Wind rising.
23	1½ p.m.	5 miles N. of Silailia	*460	66	..	34	Strong wind.
24	1½ ..	Edfoo	*570	72	..	20	Violent wind.
Mar. 15	11½ a.m.	Thebes (Kooma)	*475	64	..	68½	Calm, cloudy; the river had fallen 8 or 10 feet.
24	2 p.m.	El Marigha	*560	73	..	132	Light wind, clear.
25	1 ..	Baroot (near Siffeh)	*575	70½	..	97	Ditto, ditto.
26	2 ..	El Hassan (above El Howarka).	*615	81½	..	44	Ditto, ditto.
28	11 a.m.	Beni Hassan (below Caves).	*635	77	..	56	Ditto, ditto.
29	4 p.m.	Gier el Agoos and Iraa.	*610	83½	N.	24	Calm.
31	11½ a.m.	El Haybeh	*600	66½	N.W.	..	Strong wind, clear.
Apr. 1	1 p.m.	1 mile above Beni Sooef.	*510	74	..	76	Strong wind, cloudy.
3	2½ ..	Toora	*585	77	..	64	Light wind, cloudy.
6	2½ ..	N. end of lake of Rhoda.	*700	71½	..	7	Light wind, clear; River had fallen about 13 feet.
8	9½ a.m.	Ditto	*590	74	..	..	Strong wind, clear.
..	3 p.m.	Ditto	*585	73	..	..	Ditto, ditto.
11	6 a.m.	Ditto	*663	67	W.	..	Light wind, clear.
..	7 p.m.	Ditto	*730	80	..	..	Ditto, ditto.
17	1 ..	Atfeh	*720	79	N.E.	128	Ditto, ditto.
20	13 noon	Alexandria	*755	79	..	49	Ditto, ditto.

NOTE.—These observations are not sufficiently conformable in the elements they offer for the calculation of the differences in altitude of the several places at which they were made, to admit of a trustworthy or useful result, in that respect, being deduced from them: but it has been thought desirable to insert them as an appendix to Sir Gardner Wilkinson's paper, with the view of furnishing a specimen of the employment of the Aneroid barometer in the investigations appertaining to physical geography; and in the hope that incitement may be thereby afforded to gentlemen with adequate leisure and opportunity to prosecute the subject to a conclusion which will enable this very convenient and portable instrument to be used by the geographer with success for determining differences of level—at least such differences as are not great, as in the present instance.

For making observations from which useful results can be calculated, whether with the Mercurial or Aneroid barometer, it cannot be too strongly borne in mind by travellers that they should, as much as possible, make them under the same conditions of wind and of local atmospheric currents, and, as nearly as they can, to the time of the sun's passing the meridian at the place of observation. See on this subject the admirable Memoirs by Ramond, collected into 1 vol. 4to., Paris, 1811, entitled 'Mémoires sur la Formule Barométrique de la Mécanique Céleste, et les Dispositions de l'Atmosphère, &c.'

Note by Mr. F. Ayrton on Professor Paul Chaix' calculation of the volume of water flowing through the channel of the Nile at the season of its flood. See 19th vol. of the 'Journal of the Royal Geographical Society,' page 149.

Professor Chaix states, on the authority of Lenuat Bey, that, in the dry season, the breadth of the Rosetta or western branch of the Nile, measured at a short distance below the point of divergence of its waters through the Delta, is 435·57 mètres with a mean depth of 2·66 mètres, and a mean velocity of 0·795 mètres in a second, which gives a volume of 921·1 cubic mètres per second; and that the corresponding quantities for the Damietta or eastern branch of the river are 253·55 mètres, 4·96 mètres, and ·814 mètres, giving a volume of 821·82 cubic mètres per second. The sum of these two volumes is therefore 1742·92, which we may call 1743 cubic mètres. Professor Chaix then continues, but without citing the elements of his calculation, 'The body of water flowing during the greatest floods would be 5536·086 cubic mètres a second through the Rosetta branch, and 2629·979 cubic mètres through the Damietta branch.' He then assumes the sum of the two last mentioned numbers to be 8,166,065, and is thence necessarily led to the conclusion that the discharge of the Nile during the flood is in the ratio of 8,166,065 to 1742 (for 1743 as shown above), that is, 4600 times greater than in the dry season, and that it would so require less than 14 hours to fill up the basin of the Lake of Geneva with a superficies of 545 millions of square mètres and a mean depth of 80 mètres; and he adds that 'he cannot help doubting the accuracy of the measures which lead to such prodigious results.'

The inaccuracy results from an oversight in having omitted to insert the decimal point in the notation of the figures 8,166,065, expressing the total volume discharged by the two branches during the flood. The calculation should have been as follows:—

	Cubic mètres.
Volume of water flowing through the Rosetta branch during the flood	5536·086
Through the Damietta branch	2629·979
Total volume per second	8166·065

Which quantity, divided by 1743 (the number of cubic mètres constituting the volume of water during the dry season), will give 4685, which is the number of times that the volume during the flood is larger than that during the dry season.

The cubic contents of the Lake of Geneva will be 545,000,000 of cubic mètres, multiplied by 80, equal to 43,600,000,000 cubic mètres, which, divided by 8166·065, will give 5,339,169 seconds, equivalent to 61 days 23 hours, and which is the time that would be required for filling up the Lake of Geneva if the stream of the Nile at its flood were pouring into the lake.

From the correction now made, it will be seen, on referring to p. 150 of Professor Chaix' paper, that the volume of the Nile during its flood should have been stated to be not more than twice that of the Nera, instead of 2000 times.

ERRATUM.

In Miss Colthurst's table, part 2 of vol. 19, page 192, substitute at the bottom 6086·43 feet for 6075·78.

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XIII.—*Considerations on the great Isthmus of Central America.*

By Capt. ROBERT FITZ-ROY, R.N. Communicated by Dr. SHAW, Sec.

(Read Nov. 11 and 25, 1850.)

AMONG the important public questions of the present day is one which has attracted particular attention during the last half-century—not only as a geographical investigation, and as a philosophical problem to be solved, but as a subject eminently commercial, philanthropic, and political. The union of the Atlantic and Pacific Oceans by a navigable channel through the great American Isthmus* is the principal question contemplated.

Subordinate to this grand idea—a conception that the present age may see realised—are various schemes for roads and canals, which, since the sixteenth century, have interested the western world.†

Since Nuñez de Balboa first saw the South Sea (1513), and on his knees thanked Heaven—since Drake, from a lofty tree, beheld both oceans (1572), and, with other ardent explorers of those regions, satisfied himself that only a narrow isthmus separated the great waters—innumerable plans have been considered, with a view to effect an inter-oceanic communication.

Crowds have followed where those leaders showed the way; and a variety of information has been accumulated, which, however deficient in some respects, is now easily accessible, and needs only to be compiled, and impartially collated, in order that it may become readily available. The intention of this Paper is to give a concise summary of the most trustworthy information extant, relative to passages across the Isthmus.

Besides the illustrious Humboldt, whose works are text-books for the world, many authorities have been consulted, and the most recent information has been studied, as well as that of early date. A list of these references will be given at the conclusion.‡

The principal object in view is a navigable channel between the two oceans, through which the largest ships may pass, without breaking bulk or being lightened; the least object contemplated is a common waggon-road: and between these limits other

* By the expression "great American Isthmus" is understood all the comparatively narrow extent of land that unites the two continents, and with respect to them is, strictly speaking, an isthmus. Each narrower part of this great tract is usually referred to by a specific appellation, as the Isthmus of Darien, the Isthmus of Tehuantepec, the Isthmus of Panama, &c.

† Many proposals for canals were submitted at various times to the Spanish government.

‡ Quotations will be generally avoided, except as notes; not only to save the reader's time, but because this paper is professedly an abstract of the operations and opinions of others, and not the result of individual labour or experience.

methods of transit will be noticed ; which may be classed under four heads—namely, Ship-canals : Boat-canals : Railroads : and Waggon-roads.

Having thus indicated the subjects for consideration, our inquiry may be facilitated by prefacing it with a few brief remarks on the present methods of conveyance across Central America ; also on health in that climate ; on storms ; on volcanic effects ; on the aboriginal Indians ; and on political obstacles.

Men, horses, and mules have hitherto carried all that has been transported from sea to sea, where barges* or canoes have not floated. It may indeed appear strange to persons unacquainted with the climate and character of those regions, that in the middle of the nineteenth century, after ages of traffic across a neck of land only thirty miles wide in some places (which is not twice the length of the Isle of Wight), there should have been no road—literally no kind of continued roadway across any part of this singular barrier—until Californian gold caused old mule-tracks to be frequented, and new roads commenced. Much traffic through continued woodland, the rapid growth of vegetation, a soft tenacious soil, and an extraordinary amount of rain, have hitherto destroyed and almost effaced such attempts at road-making as were effected in former days, even by the exertions of the early Spaniards, who employed slaves, and also availed themselves of Indian labour, unscrupulously. Canoes still struggle along very irregular rivers, sometimes pushing among trees, sometimes stuck fast on shoals, sometimes endangered in rocky rapids, according to the nature and depth of the streams, which vary greatly in opposite seasons. The slow and toilsome nature of such ways can be appreciated fully by those only who have travelled in tropical forests during the rainy season.

In these regions roads must be made with large logs of wood (corduroy) or paved with stone, or else macadamised with an unusually thick layer of ‘metal,’ until an embankment (or ‘battery’) fit for a railway can be constructed.

Having referred to the climate, that subject may be noticed here cursorily, and reverted to subsequently, being a very material consideration.

Excessive wetness (rather than humidity), owing to torrents of rain, and continual showers between the periods of incessant downfall, may be considered the principal impediment to constructing roads, bridges, and the solid works of canals. Not only do these floods act immediately on the earthworks, but they cause such a quick growth of vegetation (under a tropical sun), and so rapid a decay of all ligneous substances, that man—enervated as

* Bongos.

he is by a permanently high temperature accompanied by much moisture—is scarcely able to clear the ground and construct his work before it is overgrown and beginning to decay.

Miasmatic exhalations (or malaria) are engendered in low situations, especially near the confluence of fresh and salt water, or near river mud, or decaying matter, by which illnesses are occasioned, particularly to Europeans and their descendants, before they become ‘acclimatised.’ Intermittent fevers, ague, and at times the pestiferous yellow fever, are common in such situations; but care and good medical advice cure the majority of cases; and it is remarked that those persons who have been thus ‘seasoned,’ as it were, do not usually suffer again from the same malady.

Another serious impediment to the permanence of solid works is, the liability of the greater part of these countries to the destructive effects of volcanic convulsions. It ought to be remembered, however, that the vicinity of Panama has not been known to suffer from such disturbance. That district appears to be one of those limited tracts, sometimes found in volcanic regions, on each side of which earthquakes and eruptions occur without affecting the central district.* It does not appear, moreover, that there have been eruptions or violent earthquakes during the last few centuries in any part of the narrow isthmus usually called Darien.

By storms, or by common gales of wind, the southern part of Central America is less troubled than the northern. It is not so subject to violent tempests as the coast of Mexico, and even Guatemala; but they are experienced occasionally.†

A few diminished tribes of aborigines still inhabit the mountainous ranges of some districts. The Indians of Darien visit

* Reasoning upon the cause why certain intermediate points, at the surface of the earth, and in the direction traversed by earthquakes, are unaffected by their influence, M. de Humboldt (as if to bear out the assertion of the people of Panama that their province is not troubled by them) observes: “This phenomenon is frequently remarked at Peru and Mexico, in earthquakes which have followed during ages a determinate direction. The inhabitants of the Andes say with simplicity, speaking of an intermediary ground which is not affected by the general motion, that it forms a bridge (*que hace puente*), as if they meant to indicate by this expression that the undulations are propagated, at an immense depth, under an inert rock.”—*Liet's Panama*, &c., 1849. Note in page 39, quoting from Humboldt.

† H.M.S. *Comus* experienced a gale, amounting to a hurricane, on the 17th of October, 1833. The barometer, in this instance, gave a timely and sufficient indication by falling very low. The ship therefore quitted her anchorage at Chagres. The wind blew for twelve hours exceedingly hard, from N.W. to S.W. *All the vessels at Panama were wrecked*, and houses were blown down both at Chagres and Nicaragua.

Fresh northers, of a week's duration, sometimes almost amounting to a gale, are felt, particularly during winter and spring, at Chagres, but are much more prevalent at San Juan de Nicaragua.—*Columbian Navigator*, Purdy's, 1839: p. 217, 2nd edition.

the adjacent islets and reefs. They are the descendants of those high spirited and free 'Symérons' who were never conquered by the Spaniards, but willingly joined our countrymen in many enterprises. This tribe still opposes the exploration of certain tracts; and armed as of old with lances, bows, and poisoned arrows, or with the curious blowpipe (like that of Borneo), with its needle-like missiles dipped in venom,* these still indomitable savages are jealously vigilant in guarding their own passes. Perhaps they fear the discovery of mines studiously concealed by their ancestors from the covetous oppressors of their race; and it is likely that they may dread the exploration of some easy way of communicating from sea to sea, which, leading through their own land, would inevitably cause their eventual dispossession.†

* Captain Cochrane says that these little darts are dipped in the venom that exudes from the pores of a toad (*rana de veneno*) transfixcd by a wooden skewer. "The pipe was made of two pieces of reed, each forming a half circle; these being placed together left a small hole, just large enough for the admission of the arrow. The reeds, which are about twelve feet long, were bound round with green hide, cut into thongs, and, when dry, covered with a coat of milk from the *caucho* tree (*caoutchouc*?), which, dried, prevents any air from entering, and appears of a dark brown colour. The arrows are about eight inches long, formed of a fine grained wood; the point very sharp, and cut like a corkscrew for an inch up, showing a very fine thread, that composes the spiral screw. This is rolled in the poison, which is permitted to dry on it. Round the thicker end is wound fine cotton, in the natural state, until it will just easily enter the tube, which is applied to the mouth, and aim being taken with the eye, the arrow is blown out. A practised marksman will send it with great correctness, killing a bird on the top of a high tree. The arrow will fly one hundred yards, and is certain death to man or animal wounded by it; no cure as yet having been discovered. A tiger, when hit, runs ten or a dozen yards, staggers, becomes sick, and dies in four or five minutes. A bird is killed as with a bullet, and the arrow and wounded part of the flesh being cut out, the remainder is eaten without danger. The poison is obtained from a small harmless frog, called *rana de veneno*, about three inches long, yellow on the back, with very large black eyes. It is only to be found (as my host informed me) in this place (Choco?) and another, called *Pelmar*. Those who use this poison catch the frogs in the woods, and confine them in a hollow cane, where they regularly feed them until they want the poison, when they take one of the unfortunate reptiles and pass a pointed piece of wood down his throat and out at one of his legs. This torture makes the poor toad perspire very much, especially on the back, which becomes covered with white froth: this is the most powerful poison that he yields, and in this they dip or roll the points of their arrows, which will preserve their destructive power for a year. Afterwards, below this white substance, appears a yellow oil, which is carefully scraped off, and retains its deadly influence for four or six months, according to the goodness (as they say) of the frog. By this means, from one frog, sufficient poison is obtained for about fifty arrows."—(Cochrane's *Journal in Colombia*, vol. ii. pp. 405-7.) But Dr. Cullen mentions that it is the Wourali or Curare poison which the Indians of Darien use; that it is called by them "*Corova*," and that it is made by mixing the juices of two trees which grow in the province of Choco. Waterton does not describe animal poison as being used by the Indians of tropical America. His account of the Wourali is well known.—Waterton's *Wanderings*.

In Borneo the poison used does not long retain its strength. Probably many varieties of poison are used for these little darts, as well as for ordinary arrows. Our countrymen were frequently wounded by missiles of these kinds in Borneo, without fatal consequences ensuing. See Mundy and Keppel.

† This fact is not less interesting on account of the resemblance between these Indians and the Araucanians, besides others similarly circumstanced.

Several other tribes of natives exist in the northern provinces, besides those long-trying friends of the British, the Mosquito Indians. As usual with aborigines, they shun settled districts, and dislike the laborious occupations of civilised man.

There is yet another hindrance in the way of those enterprising spirits who would undertake great works on the isthmus, which is really of consequence, namely, the political instability of the local governments. With well established and settled authorities it would be comparatively easy to make secure arrangements, but in such unsettled states as those of Central America, the political part of the question is certainly not the least difficult; and where it is proposed to carry a way through more than one state, obstacles of a moral kind oppose themselves still more forcibly. The best-concerted plans, the most elaborate precautions, the most just and liberal treaties, may be suddenly cancelled, and scattered to the winds, by revolutionary commotions.

It is necessary to remark, farther, that irrespective of climate or political considerations, there is one chief requisite, one main point, to be insisted on, in connection with any route or line intended to be available for general utility, without which advantage permanent success will be impossible. This indispensable adjunct is a good port. Without such a place of resort, at each end of any canal or railroad, easy of access and sheltered at all times, shipping could not effect their objects securely, and in definite times. Delay, expense, and risk must be the consequences of using a route unprovided with adequate harbourage.

To explain and illustrate the urgency of this consideration, let us imagine a ship-canal completed. It would not be practicable to sail into such a canal direct from the open sea. Safe anchorage must first be obtained very near the entrance; and that opening must itself be perfectly protected, not only from injury by land-floods, but from the effects of storms; from the surf and the heavy swell of the sea; and from any accumulation of mud, sand, or shingle.

Another momentous consideration must not be forgotten, which is, that the larger and better the canal, or other means of intercourse (*ceteris paribus*), the more will the world at large profit; while, on the other hand, the smaller the scale of the work effected, the more exclusively local must it become in value. An injudiciously chosen place, or a work of too limited a character, would mar the grand object, that of facilitating the intercourse of the world.

Such a communication as we are contemplating would attract crowds of shipping. It would be a thoroughfare for all nations. Let us think for a moment of the forest of masts that meets the eye in a large mercantile port, and remember that a greater multitude

of vessels may be expected, and ought to be provided for, in the event of a readily available passage by water, or even by land, being opened across the American isthmus.

Several lines have been proposed for a canal or a railroad, and each has its earnest advocates; but as interested motives may influence, and prejudice may bias opinions, it is absolutely necessary for persons who wish to be impartial to examine and compare the merits of these lines independently, without trusting to the opinion of any individual, who may be more or less biassed in favour of one particular route.

Four principal lines have been hitherto recommended, to which may be now added for consideration at least three more that offer advantages not to be undervalued, and some others of which a brief passing notice will suffice.

Taking the four principal lines in order, from north to south, the first is that between the Gulf of Mexico and Tehuantepec, which may be called, for brevity, the *Mexican line*.

The second is through the great Lake of Nicaragua, and is well known as the *Nicaragua line*. This popular route is usually taken from the Atlantic, along the river San Juan to the lake; but from thence to the Pacific no less than six different and totally distinct courses have been recommended. In this paper these separate propositions will be considered as branches of the Nicaragua line.

The third route crosses the isthmus near Panama, and is of course termed the *Panama line*. The fourth, from the Gulf of Darien, by the Atrato river to Cupica bay, is known as the *Atrato and Cupica line*.

Of the three lines next in importance, one is from the Chiriqui lake to Dulce gulf. Another from the gulf of San Blas or Mandinga to Chepo, in the bay of Panama; and a third from Caledonia bay, in the gulf of Darien, to the gulf of San Miguel. These almost unknown routes, the *Chiriqui*, the *San Blas*, and the *Darien*, may be considered after the four principal lines have been examined; and the other routes suggested may be noticed in passing.

The *Mexican line*, over the isthmus of Huasacoalcos (or Coatzacoalcos) leads from the mouth of the river so called, in the 18th parallel of latitude, to the gulf of Tehuantepec, near the 16th. It is about 120 miles* across, in a straight line from sea to sea, and is nowhere very much elevated: about 700 feet above the sea is, however, the lowest summit level.† The rivers

* Geographical miles, sixty to a degree of latitude, are used in this paper throughout.

† Detailed information may be obtained in this case, as in the following, by reference to one or two of the works specified at the conclusion of this paper.

that appear to afford some facilities are not really of much importance, as their waters are not deep enough to be navigable far. Their sources are separated by a tract of rocky country, and their entrances are barred by sandbanks. The adjacent coasts are frequently troubled by furious storms,* and there is no port. Nevertheless so much has been thought of this locality, that elaborate surveys have been made on two occasions; one near the end of the last century, and the other in 1842-3.† Moreover, at the present time there are persons interested in this district sufficiently to have obtained a call or an extra session of the legislature of New Orleans, in order to carry out their plans, which in that State are exceedingly popular.‡

One argument much used in favour of this proposition is, the comparatively level nature of the country intervening between the oceans; but the elevation above the sea would require a great number of locks for any canal, and a sufficient supply of water would be uncertain. A railroad may soon become locally valuable; but for the present a good waggon-road, from river to river, appears to be all that the insuperable disadvantages of position will admit, since hard gales often blow towards the land, and there is actually no port near either river in which shelter can be obtained for any but coasting craft, or other small vessels.

Other arguments are more favourable to this route, which are derived from its climate being less unhealthy than that of other lines to the southward; from its supplies of stone § and timber; from a native population inclined to work moderately, besides many peopled districts within reach, whence labour could be obtained; and from the vicinity of the United States, on one hand, while California is near, on the other. To these may be added the fact that this proposed line is entirely within one territory, therefore political obstacles might be less tardily overcome. But the work could never interest the world at large, as one more remark will probably suffice to show. The gulf of Mexico is not in the line of general intercourse between the two great oceans.

* Called "Nortes," "Tapayaguas," or "Papagayos," according to their direction—N.—S.W.—or N.E.

† In the fourteenth volume of the Journal of the Royal Geographical Society (Part ii., pp. 306-15), are the chief details of Don José de Garay's survey, executed by Moro and other qualified persons. At page 310, the locality called Tarifa is described as the proper place for dividing the waters (the lowest watershed, or summit level), so that they should flow both ways—part towards the Pacific, and the rest towards the Atlantic. The altitude of this position is given, by trigonometrical measurement, as 208.5 metres above the sea; which is 702.4 feet English. The shallowest water found then on the bar of the river Huasacalcas was said to be 6.2 metres, or nearly 21 feet English: but this is a controverted point; other authorities state that only 14 feet can be relied on in dry seasons.—*Liot*, pp. 7, 8.

‡ £100,000 value has been subscribed very lately for the purpose.

§ The Cerro del Convento is "a rock of pure marble."—*R. G. S. Journal*, vol. xiv. part 2, p. 310.

On account of prevailing winds and currents, ships sailing from Europe or North America must pass through the Caribbean Sea before reaching the Gulf of Mexico; and, therefore, to turn northward again to cross it, when bound to any place except California, would be going considerably out of the way, besides incurring exposure to unnecessary risk and difficulty.

On this part of the isthmus it appears then, that roads may soon become of much local value, and facilitate a passenger-traffic between New Orleans and California; but that the want of ports, and the inferiority of geographical situation, must inevitably bar its importance to *general* commerce.

The *Nicaragua line* has long attracted much attention, and public opinion in the United States, as well as in Europe, is at present rather in favour of this route. In point of geographical situation, no objection exists with reference to the general line of commercial intercourse; but exposed to gales of wind, without adequate protection from their effects, most of the proposed terminations of this route are unfit for the use of large vessels, except during very fine weather. Six branch lines, from the great lake of Nicaragua to the Pacific, have been advocated: one to the gulf of Conchagua (or Fonseca); a second to Realejo; a third to a branch of the river Tamarinda (these three being through lake Managua); the fourth to San Juan del Sur; the fifth from the Sapoa river to Salinas Bay; and a sixth from the southern part of Nicaragua, or from the river San Juan, to Nicoya gulf.

The first branch, to Conchagua, has neither been surveyed nor fully explored; the second, to Realejo, has been partially surveyed; the third, to the Tamarinda, not at all; the fourth, to San Juan, has been carefully surveyed; the fifth, by Sapoa, has been partly examined and measured. The first glance shows that the length of these lines and the number of locks must be great; and the immediate conclusion is, that delay and expense must be proportionally augmented. But these evils may be more remediable than the want of ports.

Unfortunately there is a great deal of bad weather on these coasts; and, with a view to canals or railroads, it is necessary to contemplate the character of the seasons, not at certain limited periods only, but throughout the whole year. Besides storms from the north-west during the rainy season, gales from the north-east are experienced during the dry period; therefore, harbourage is always indispensable. Excepting at two places on the Pacific, hardly available on account of their remoteness or position, there are no ports suitable for *large* ships near the terminations of this line. San Juan, now called Greytown, the only anchorage on the east coast, affords shelter to a few vessels of the smaller classes, but to them alone.

On the outer west coast there is no available harbour, excepting

Salinas bay, until Realejo is reached (which is about 70 miles distant from lake Nicaragua), or Conchagua gulf, which is nearly 100 miles from any part of the great lake. The cove on the outer coast, called San Juan del Sur, is too small and too much exposed to the ocean to be of constant service. It is but five cables' lengths across, which is only just room enough for a large steamer to turn with facility (without reference to other vessels, or the beach). It is exposed to the ocean swell, and to winds which are there very violent.

Nicaragua lake is so large (being nearly 90 miles long, and about 30 in width), that artificial harbours at the mouths of any canals opening into it will be necessary. In the comparatively still water of the lake they might be constructed, however impracticable in the open sea, where no shelter exists for such operations. The water in Nicaragua seems to vary in depth, irregularly, from 2 fathoms to 40 and upwards. It has not yet been sounded, except in a few places; but recent surveys show shallows near the rivers San Juan and Panaloya, which it may be very difficult to avoid, or even partially deepen. It has been stated that there is an ebb and flow of tide in Nicaragua, which seems unlikely, as it is elevated much too high above the sea (about 125 feet) to communicate with it underground, and is not large enough to have an independent tide. Variation in the level of the lake would be in favour of hydraulical operations, especially the removal of obstructions, and the construction of works under water.*

In the river San Juan there are rapids, and in the river Panaloya (or Tipitapa), which leads from Leon (or Managua) lake, there is a sudden fall of 13 feet, caused by a dyke of recent lava. In both rivers there are places almost dry across during the summer; and in both the winter rains cause great floods, overflowing their banks and inundating the low lands. It is evident, therefore, that these rivers could only serve as the principal feeders of canals, and that they cannot themselves be made navigable for large vessels.

It is said that the surface of Nicaragua is about 125 feet above the mean level of the ocean, and that the surface of Managua lake

* In Purdy's *Columbian Navigator*, it is stated that "the lake (Nicaragua) abounds with fish, which are so much the better from its having a flux and reflux, like the sea."—*Columbian Navigator*. Purdy: 1824. Vol. ii. p. 141, and vol. iii. p. 241. 1839.

Probably the watermarks at the border of the lake, caused by difference of level at opposite seasons of the year, have given rise to a belief in the existence of a "flux and reflux of tide."—R. F.

M^{rs} Queen likewise mentions this report of a tide in Nicaragua lake in his work on *Communication by Steam*.—p. 98: 1838.

This ebb and flow may perhaps be explained by the phenomenon "Seiches" observed in other large lakes, such as that of Geneva, &c., for which see *Journal of the Royal Geographical Society*, vol. iii. p. 271, for an article by Colonel Jackson on this subject.—ED.

is about 28 feet above that of Nicaragua.* From the Atlantic, at the mouth of the river San Juan, it is more than 80 miles to

* In Mr. Bailly's work, and in the pamphlet which is said to bear the initials of the President of the French Republic, there are statements respecting the relative levels of the oceans, and of the lakes Nicaragua and Leon, that appear to be oversights. Mr. Bailly ascertained the height of Nicaragua above low water in the Pacific at *San Juan del Sur*: he applied the difference between low water at Panama and low water at *Chagres* (according to Colonel Lloyd), and refers the level of the lake to the assumed low water levels of the oceans—on the supposition that the rise of tide at *San Juan del Sur*, as well as at *San Juan del Norte*, or *Nicaragua* (Greytown), equals those of Panama and *Chagres*, respectively. But this is not the case. There is a greater rise of tide at Panama than elsewhere on those coasts (except *San Miguel*), and a smaller at *Chagres*. In the pamphlet above mentioned (that by N. L. B.), there are given Mr. Bailly's elevation of Lake Nicaragua, and the height of Leon (or Managua), above it, as stated by Messrs. Stephens and Rouland. To these are added an assumed difference between the level of the oceans, obtained from M. Garella, of 19½ feet, which makes the assumed heights above the Atlantic not only that quantity greater than Mr. Bailly's, but 26 feet greater; as the Pacific at low water is assumed to be 6½ feet lower than the Atlantic at low water. Thus N. L. B. makes Nicaragua lake 148 feet (nearly) above the Atlantic, while Mr. Bailly calls it 122 feet (nearly)—a remarkable difference.

Had all these observations been referred to the mean level of the ocean, at the respective places of observation (or as near to them as practicable), it would have been far less unsatisfactory. Moreover, in none of these measurements does any allowance seem to have been made for about 6 feet variation in the level of Lake Nicaragua in opposite seasons. The half of this, or 3 feet added to the elevation of the lake in the dry season (when Mr. Bailly observed), would make 131 feet above the (estimated) low water of the Pacific. To illustrate the uncertainty of such measurements, when not referred to mean heights, or "datum levels" of water, it may be mentioned that at Panama the sea usually rises about *twenty-one feet*, at *San Juan del Sur* about *thirteen feet*, and at *Chagres* only *one foot*, at spring tides.

In estimating the level of Nicaragua lake, in this paper, the following steps are taken:—

Bailly's elevation above low water at S. Juan del Sur	feet	in.
at full moon, when the tide rose 12 feet	128	3
	— 6	0 = $\frac{\text{rise}}{2}$
Low lake above mean sea	122	3
Half variation of lake	+ 3	3 = $\frac{\text{Variation}}{2}$
Mean elevation of lake above mean height of Pacific	125	6
Ocean	+ 6	6 = $\frac{\text{greatest rise}}{2}$
Greatest elevation of lake above mean height of sea	132	0

In 1781 the Spanish engineer, Galisteo, made the elevation of Nicaragua lake 133½ feet above the sea (probably the Pacific), a close agreement with modern measures as 133½ feet Spanish = 124 feet English.

In 1796 Ulloa and Jorge Juan inferred that the mean level of the oceans could not differ much, if at all, at the isthmus of Panama, because their barometers showed equal pressures at the shores of each ocean. Humboldt made a similar conclusion. Lloyd ascertained that there is not more than three or four feet difference of level at Panama (the Pacific being the highest), and that the times of high water correspond. But M. Garella says that there are *nineteen feet and a half* between the levels of high water in the Pacific and low water in the Atlantic ocean, which seems to require corroboration—if he means what has been quoted by N. L. B. at page 11 of his pamphlet.

the lake, in nearly the mean direction of the river; and from Fonseca, or Conchagua gulf, to the north-west part of Nicaragua, the very shortest line that could be taken for a canal would measure more than 90 miles. It is more likely, however, that each of those distances would exceed 100 miles, including all bends; and, as the ground is very irregular, some idea may be formed, off-hand, of the vast number of locks that would be required, of the delay, labour, and expense of towing ships through, and of the time that would be occupied. Between Realejo (which is by no means so good a port as had been usually supposed) * and Managua lake, about 45 miles of canal would be required, and the highest level necessary would be about 212 feet above the Pacific; but at that elevation it is doubtful whether a sufficient supply of water could be *there* secured without an immense cutting, 11 miles in length, and not less than 70 feet deep (wide enough also for a canal), to convey a stream from Managua. From one ocean to the other not much less than 100 miles of canal would be indispensable, if the shortest lines were adopted; but probably nearer double that extent would be required, if the longer route, to Conchagua, were followed.

The favourite idea of cutting a canal from Nicaragua lake to the nearest part of the ocean, at San Juan del Sur, is checked by the fact that a range of land intervenes, through which it would be necessary to tunnel, and that there is not a sheltered harbour into which the canal might open, and where numerous shipping might anchor in security.

San Juan del Sur, it may be repeated, is only about 1100 yards across, open to the ocean swell, and exposed to very strong winds. The elevation of the proposed tunnel would be at least 120 feet above the lake. It must be from 1 to 2 miles in length, of dimensions hitherto unattempted, and the lowest level *over* it would be some 600 feet above the sea. How a sufficient supply of water could be obtained, is a matter of mere conjecture.

To what has been said above must be added the reflection that this district abounds in volcanoes and is subject to earthquakes.†

* See Belcher.

† Every writer on Central America describes the effects of volcanoes and earthquakes in that much disturbed region; but Mr. Baily relates (pp. 77, 78) a curious instance of the rise of a volcano to a considerable height (about 1500 feet above the sea) from a spot where men living in this country had milked cows. Some of these volcanoes eject lava and huge fragments of rock; some scatter wonderful quantities of ashes, mud and torrents of water flow over the country adjacent to others; while the relative levels of various districts are changed, sometimes suddenly, but more commonly by slow degrees. These natural convulsions are not rare occurrences, at long intervals of time, but frequent, as the annals of even late years show.

It is worth notice, as showing how prevalent the idea of volcanoes is in Nicaragua, that the *Arms of the State*¹ are *five volcanoes in action*—with some other minor device.—R. F.

¹ *The Seal of Government*!

In point of climate it is much the same as other parts of the great isthmus in similar situations, such as elevated or low, exposed or sheltered. Nevertheless, surveys have been minutely executed in some parts of these proposed routes, much has been said and written about them, the subject has become familiar, and conclusions have been rather generally drawn in favour of Nicaragua. These surveys, however, have not really tended to diminish the formidable appearance of so many natural obstacles. They have only given actual dimensions and position to what was before uncertain and shadowy. From surveyors themselves we cannot expect to hear much of comparative disadvantages. Earnest in their undertakings, whether independent or on behalf of employers, objections and difficulties are not accumulated. They are more likely to make too light of obstacles (with which they themselves may not have to contend), and they naturally refrain from depreciating the undertaking in which they are interested.

It is common to *under-estimate* the power of natural forces, when not immediately or visibly in operation. The swell of the ocean, the tornado, the torrent and inundation, and the wide-spreading effects of volcanic convulsions, are almost unheeded at a distance. Houses, several stories high, are to be seen newly built among the ruins caused by very recent earthquakes; and men, hoping to escape in future, close the page of history.

The next branch line from Nicaragua is from the mouth of the Sapoa river, at the S.W. part of the great lake, to Salinas bay. It is said to be about 15 miles in length, half of which is by the river, and now navigable by boats. No exact survey has yet been made, but estimated levels and distances have been noted by a competent observer (Dr. Oersted) in exploring the line. The port of Salinas is accurately known, and is a very good harbour. Between Salinas and Nicaragua the lowest summit level is supposed to be only 130 feet above the lake, and about double that elevation above the sea. There is sufficient water (it is stated) to supply a canal at that elevation. This is certainly a very interesting quarter; but more information is much wanted, especially as to levels and the supply of water.* The slight notice previously taken of this route by Spaniards or

* Dr. Oersted made his examination of this promising district in 1847, in company with Dr. F. Gutterix (?), but was in want of the instruments necessary for accurate measurements. He states (to the minister of Costa Rica, Don Joaquín Bernardo Calvo), that the formation of a canal is there (at the Sapoa) quite possible. But he does not appear to contemplate the excavation of a *large ship-canal*. The River Sapoa, from his description, would serve only as the feeder of a canal. The highest ground that must be crossed, which he estimates at 270 feet above the sea, extends about 1200 yards only, and has higher ridges on each side, from which streams of water flow. Thence to the sea, at Salinas Bay, is about 6 miles, across low level land, with a sandy, clayey soil. The higher ground is a firm stratum, composed chiefly of porphyry, which breaks easily.

aboriginal inhabitants of the country, inclines one to anticipate some graver obstacle than has been recently stated, otherwise it must be a route more favourable than either of those to the northward which have been examined more closely. It is entirely in Costa Rica.

A sixth proposition is to connect Nicoya gulf with the southern part of Nicaragua, or *directly* with the river San Juan by the help of the river San Carlos. In this case an available port exists in the Pacific, but a large extent of land intervenes between the oceans, which has not been surveyed, and may be found too much elevated or in other respects impracticable.

The respective peculiarities of these six branches, as they may be called, of the Nicaragua line, cannot yet be described minutely, because insufficiently explored, excepting those of the branch by San Juan del Sur. Enough, however, is known to discourage any attempt to construct either canal or railway, unless the Sapoá track should prove to be as eligible as Dr. Oersted believes. Even then there will be the disadvantages of so inferior a harbour as that of St. Juan (Greytown), and the difficulties of the river. The disadvantages of the harbour are likely to increase, as the spit which partly shelters it is augmented yearly. The variable river, San Juan, must be cleared from its numerous obstructions, though renewed annually by floods. Untouched forests, swamps, mudbanks, and durable masses of rock, characterise both banks; and the climate of the low grounds is most pestilential. Of the materials necessary for constructing locks and other buildings, there is abundance of the finest timber, but freestone and limestone are rare. Mr. Baily says he found limestone near San Juan del Sur, but other accounts differ considerably.

The reflection cannot be avoided that, in this district, the uncertainty caused chiefly by political instability (three States being concerned, Costa Rica, Nicaragua, and the Mosquito territory) is greatly augmented by a sense of physical insecurity. Volcanoes of considerable height having risen within very recent periods; prodigious quantities of ashes, water, and lava, having been from time to time thrown over the country; and the relative elevations of land and water having been materially changed—all within the memory of living men—undoubtedly justify great hesitation in undertaking any extensive engineering operations.

Having examined the Nicaragua line and its branches with reference chiefly to a canal, it seems only necessary to remark, in this place, that no good road, on a large scale, could be profitably maintained for the *general* use of the world in that district, on account of the comparatively great distances that must be tra-

versed, the frequent alternations of land and water conveyance, and the want of adequate harbourage at the terminations.

The third principal line is by Panama.

Numerous explorations have been made in this vicinity. Canals have been proposed, and various lines have been more or less closely examined. Four routes have been critically surveyed throughout the whole distance by Lloyd and Falmere, by Morel, Garella, and Hughes: along the last line a railroad is now in progress. This adopted route leads from Limon, or Navy bay, to Panama city, passing by Gorgona. It is to be carried about 36 miles, over elevations of nearly 300 feet, through a tunnel, and over large viaducts and bridges.

Supposing this to be the best line for a railroad between the terminations selected, let us inquire whether each terminus is at or near a good port. Chagres is well known to be unfit for large ships, but Limon bay has space and depth of water towards its *outer* part amply sufficient. Unfortunately, however, it is open to the north wind, which at times blows hard, driving in a heavy sea, and half of the bay is so shallow that when northerly gales prevail, there is a great surf in that part. A breakwater has been proposed, but a work so gigantic as would be required must exceed all that has been effected of a similar kind in modern or ancient times. A mole, or breakwater, would not fulfil its object in Limon bay unless extending more than a mile in length in at least 6 or 7 fathoms water. During its construction the heaviest seas would interfere at the time most suitable in other respects for making progress. Many comparisons of difficulties in respect of materials, labour, provisions, and climate, occur to mind readily while reverting to Cherbourg, Plymouth, Genoa, Alexandria, Algiers, or other places, where works of such a nature, but carried on under infinitely more favourable circumstances, have cost time and money far exceeding what can now be contemplated for any enterprise not of *vital* importance to any *one* country, however conducive to national prosperity and to the general interests of mankind.

Limon bay is not, at present, a safe port for shipping. It seems to be practicable, however, to excavate a large wet dock, or basin, between Manzanilla island and the main land, at the terminus of the railroad (in progress); and, if such a work were executed, Limon bay would become a useful roadstead accessory to an artificial harbour.

On the opposite coast, near Panama, a spacious and tolerably sheltered anchorage, with access to works *carried out into the sea*, may be found in the bay, but not very near the city. This limited separation, not exceeding two or three miles, would be but slightly detrimental to a roadway, if security, easy access,

and sufficient sheltered space could be obtained for a considerable number of vessels.

The great rise of tide at Panama, about 3 fathoms,* would much facilitate operations, and would also favour the construction of dry docks, so much wanted in the Pacific; but at present the proposed terminus is 2 miles from the nearest anchorage of ordinary shipping—2 miles across open sea—which is a serious inconvenience, and will be greatly felt in transporting merchandise, unless a viaduct can be carried out into deep water and protected from the ocean.

Although Panama bay is usually tranquil and not disturbed by much wind or sea, it is recorded that all the shipping lying there have been stranded, and other extensive damage done by an unexpected tempest.†

From Limon bay to Panama is about 33 miles in a direct line. Many rivers and ranges of hills intervene. Floods sweep the low grounds during the rainy season. The rivers are so irregular that they can be used only as feeders for a canal. They cannot be rendered navigable throughout the year for large ships.

The works necessary for a ship-canal must be on the greatest scale, not only if the lowest summit level to be passed be nearly 300 feet, which is that of the proposed railroad, but if Garella's plan, avoiding a greater elevation than 150 feet, should be adopted. It has been stated that a line may be taken between the rivers Trinidad and Caymito, in which the highest elevation does not exceed 40 feet above the sea;‡ but this account is contra-

* From two to four fathoms; sometimes more, according to Lloyd.

† Besides the remarkable instance of a severe storm in Panama Bay, already quoted in note †, p. 163, other similar occurrences are mentioned by Spanish authorities, which it would be unnecessarily tedious to recapitulate. Sufficient distinction is not always made by writers between the nature of the prevailing winds and weather of the *dry season*, and those of the *opposite period*. It is not invariably remembered that the usual descriptions of these regions, especially the Spanish, were given with reference to that time of year at which *alone* commercial intercourse could be conveniently carried on—the *dry period*—but that now we want to establish a communication throughout the whole year, at precisely regular times, irrespective (almost) of wind or weather. Panama bay is exposed during the long rainy season to westerly winds, which send in much swell. Their name, "*Venda vales*," may have been derived from the fact of their bringing much rain, and therefore stopping not only the sale of merchandise exposed in the open air, but almost all commercial intercourse. "*Venda*" meaning sale, and "*vale*" farewell, seem to be the origin of the word. It may, however, have been derived from *vento*, or *viento*, wind—and *vale*,—this wind being most unhealthy in some places.¹

These westerly winds prevail throughout Central America during the rainy season. In Mexico they are called *Tapayanguess*.—("Tapar," to hide, and "*agua*," water—*Tapar de aguas*?)

‡ Morel's plan.

¹ Causing many deaths, and therefore giving rise to the term, the *farewell wind*, or wind of parting from friends.

dicted by other authorities. If such a low summit level of the land exist, a channel might possibly be made from sea to sea, without a lock, navigable by the largest ships. In order to attain the lowest possible level, Garella proposed to excavate a tunnel, 125 feet in interior height, 97 feet wide, and nearly 3 miles in length. With such an enormous work and about 33 locks, he proposed to accomplish the grand object. Lloyd suggested a canal from Limon bay into the Chagres, and a communication between the Trinidad and the waters of the south by railway, if not by canal.

Not to mention the great works of the Old World—the extraordinary Mexican “*Desagüe*,” 200 feet deep and 300 feet wide for nearly a thousand yards, and above 100 feet deep through an extent of 3000 yards (making altogether 2 miles of distance in which that vast excavation would be capable of concealing the mast-heads of a first-rate man-of-war), this wonderful work, executed within the last three centuries in Central America, should induce us to listen respectfully to the plans of modern engineers, however startling they may appear at first. Humboldt says, “The ‘*Desagüe*’ is undoubtedly one of the most gigantic hydraulical operations ever executed by man.”

Whether a supply of water sufficient to feed a canal could be secured during the whole year, at an elevation of 200 or 300 feet, near Panama, seems to be doubtful, although in so rainy a climate and among ranges of heights elevated above the summit level considerably, because the summer is very dry; and the soil is extremely porous on the high lands. As no safe port is now available about this part of the isthmus, except Porto Bello, and as that harbour is so unhealthy as to have been formerly termed “the grave of the Europeans,” it may be doubted whether even a railroad will be remunerative; but assuredly there are not at present inducements sufficient to warrant the employment of private capital on a great canal. Under existing circumstances a waggon-road between Porto Bello and Panama appears to be the most feasible and least uncertain scheme, while it would tend to facilitate and encourage, rather than injure, greater undertakings, of which it would be the natural precursor.

The insalubrity of Porto Bello was diminished by clearing away woods, and might be much further improved by burning down forests,* draining marshes, and using a different site for

* Although it is difficult to burn forests in a very wet climate, it may be done by first cutting a quantity of (inner or solid) wood, piling it in a great heap, and setting it on fire close to a thick part of the forest. The heat caused will soon dry the nearest trees, which will then catch fire, and when once a sufficient body of heat is generated, a rapid conflagration will follow. Green wood burns faster and gives more heat than dry wood under the influence of fierce fire.

Even on the humid banks of the Atrato, Cochrane “saw the underwood catch

buildings. By such means the greatest evil—unhealthiness—may be so far lessened as to admit of this port being placed on an equality with other harbours on these coasts. Before proceeding further, reference may be made to the geological character of this part of the isthmus, and to the materials accessible for purposes of construction. A recent examination* informs us that the greater part of the rocks are porphyritic or hornblendic, that limited lines of granite and schistose formations occur, that silica is deficient, quartz rare, and limestone very scarce, but that iron is abundant. There are very few argillaceous deposits, and only a small portion of aluminous rock. Lime and building-stone are obtained from coral rocks on the Atlantic coast. Shells alone afford lime on the Pacific. On that side a kind of aluminous magnesia is found in thin layers, and is said to be appropriate for building. Nearly all the rocks are igneous. Stratification is not found, excepting in a few instances such as the above, chiefly near the sea, or in valleys between ridges of mountains. It will be difficult therefore to procure materials, except timber, for any great work; and the want of good clay, fit for lining (or puddling) the banks of a canal, may be a serious impediment, though by no means insuperable.

It is ascertained that there is only a trifling difference between the levels of the oceans at this isthmus. A rise of tide, not exceeding 2 feet, is found on the Atlantic side, while in Panama bay the tide rises more than 18 feet;† the mean level of the Pacific in this particular place being 2 or 3 feet above that of the Atlantic. It is high water at the same hour in each ocean.

Passing reference having been made to the importance of docks at Panama, it may be brought to mind that this is one of only three localities in the whole of the great southern ocean, where dry docks for large ships can be readily constructed.‡

The fourth principal route is the *Atrato and Cupica line*.

From the inner part of the Gulf of Darien (called Candelaria, Choco, or Culata§), up the river Atrato, and along part of the river Naipi, or Naipipi, and thence across to Cupica bay, is a distance of 114 miles (by estimation), of which about 19 only are overland. Two-thirds of this distance (76 miles) are said to be now navigable for large ships, and half the other third (or 19 miles) by loaded boats. It is supposed that a canal may be excavated through the small remaining distance (19 miles) without extraordinary difficulty; and it is proved that it might open

fire and burn rapidly, consuming a great part of the forest."—(Cochrane, vol. ii., p. 452.)

* By Mr. Hopkins.

† Extreme rise known = 28 feet.

‡ The other two are Guayaquil and Chiloe.

§ Culata del golfo.

into an excellent port—that of Cupica, in which are coves *perfectly sheltered*, with *deep water* in them *close to the shore*.*

Cupica bay is spacious, but open to the south-west. In that latitude, however (6° N.), south-west winds are seldom strong; very rarely do they cause disaster; and as evidence that this bay is not affected much by them, it may be mentioned that trees grow down to the *water's edge along the beach*, and that there are no indications of a heavy surf having been known. There is shelter for any ships, in sufficient water, on each side of the bay, land-locked.

The recent survey, by Admiralty order, is quite satisfactory, as to the purely hydrographical part; but, of course, it does not show the topography of the adjacent district beyond the coast.

As this line has not been surveyed, though frequently travelled over, and as sanguine hopes are entertained that the locality may afford all the indispensable facilities for effecting a great ship-canal, it is necessary to look closely into the grounds on which such expectations are based, and try to ascertain their real character.

The officer who recently surveyed Cupica (Lient. Wood, R.N.) states, with respect to the land between it and the Naipi, that he set out one morning from Cupica at eight o'clock, walked with native guides to the Naipi, rested there, bathed in the

* A merchant of Carthagena, Don Ignacio Pombo, wrote to the Baron de Humboldt, in 1803, "I have never ceased to take information respecting the Isthmus of Cupica. There are only from 5 to 6 leagues from that port to the embarcadero of the river Naipi, and the whole territory is a perfect level (*terreno enteramente llano*)."
In Scarlett's book this quotation is followed by remarking that the communication he had held with different persons who had collected information upon that Isthmus, left him no doubt that Pombo's account was correct.

Mr. Watts, ten years Vice-consul at Carthagena, was acquainted with the owner of an estate on the Naipi, Señor Coutin, who was in the habit of crossing to the bay of Cupica, and told him that the rise between the bay and the river was gradual, and only about 150 feet in the whole. Mr. Watts stated that the Indians habitually carried their canoes from Cupica to the Naipi.—(*Scarlett*, vol. ii. pp. 251, 252.)

Humboldt, speaking from the reports of others, says, "From Cupica we cross, for 5 or 6 leagues, a soil quite level and proper for a canal—which would terminate at the embarcadero of the river Naipi. We might almost say that the ground between Cupica and the Atrato is the only part of all America in which the chain of the Andes is entirely broken. A very intelligent Biscayan pilot, Gogueneche, turned the attention of government to the Isthmus of Cupica, which *ought to be for the new continent what Suez was formerly to Asia*."
—(*Humboldt*, *New Spain*, vol. i. pp. 39, 40. Black's 3rd Edition: 1822.)

Robinson, in 1813, learnt from Spaniards at Carthagena that, from the navigable part of the Naipi to Cupica was 24 miles, across a level tract of country.—(*Pittman*, pp. 61-4.)

In 1820, Captain Illingsworth, of the Chilean frigate *Rose* (or *Audes*), caused a launch, carrying fifteen men, to be drawn across this space, in ten hours, the men having to cut the 'bush' as they advanced.

* (Watts, MS., and others.)

stream, then walked back, and reached his ship (the 'Pandora') at noon. The guides told him that he could reach the place where loaded boats (bongos) stop, in four hours from the time of his arrival at the Naipi, by continuing to walk at the same rate (about three miles an hour, more or less, according to the ground). The place where he bathed was 5 or 6 miles from Cupica, and the point to which loaded boats ascend the Naipi (embarcadero) was then about 12 miles distant by his estimation. At first leaving the sea-beach the way was by a rapid ascent, till an elevation of about 200 or 300 feet was gained, but thence it appeared nearly level till he reached the Naipi. The most elevated ground that he walked over was not, in his judgment, 400 feet above the sea; but he thought it more than 300. He went by Indian paths, the shortest way, along the driest and clearest, therefore probably the higher ground. The natives would not consent to go, as he wished, along a river from the head of the bay, which seemed the lowest line of route, but insisted on striking direct across the higher ground.*

Independent of this account, by an officer now in England, other concurrent testimony shows that between the partly navigable portion of Naipi and the bay of Cupica there is a tract of comparatively low land through which a canal may be cut. That a road of any kind may be made there readily is shown by the fact that a boat has been dragged across in a few hours.†

With respect to ports, the survey above-mentioned vouches for that on the Pacific; and, on this side, all the gulf of Darien, and Choco, including the mouths of the Atrato, have been recently well surveyed; and there is no question as to the real excellence of the extensive harbourage in that quarter.

The character of the Atrato, and likewise that of the Naipi, are the next considerations. There are bars (sand or mud banks) at the mouths of the Atrato, which prevent the passage of vessels drawing more than five or six feet of water;‡ but within those bars (which may be partly removed, or avoided by a short canal into the gulf), or rather above the delta of the river, there is said to be water for any ship, to a place far above the junction of the Naipi. The union of that river with the Atrato appears to be about 80 miles south of Choco gulf—the southernmost part of the gulf of Darien (called also Culata, or, *incorrectly*, the bay of Candelaria); but distances thereabouts, *within the outer coast lines*,

* There can be little doubt that a march along the banks of a river in that latitude and climate would have proved to be a struggle through mangroves and mud, among alligators and snakes. Moreover, it is customary for Indian natives to select the higher grounds for their journeys, with a view to greater security from their enemies, as well as for more facility in travelling.

† The Chilian launch.

‡ Rise of tide = 2 feet.

can only be taken approximately at present. We know that the town of Citerà or Quibdo (otherwise Zitarà), on the Atrato, is at least 120 miles in a direct line from Choco gulf; and to that town vessels of about thirty tons burthen (champanes), coppered, and fit for a sea-voyage, trade regularly from Carthagena and other places. The passage of these loaded traders cannot be difficult between Quibdo and Choco gulf, as they can sail or drift down the river, not only by day, but by night.* They never tow, or 'track.' It is said to be a "noble river," wide, tranquil, and free from impediments; but it has not been accurately surveyed. The bars at the mouths are the only known hindrance to navigation, but that may be remedied, as above-mentioned, by a short cut; or by *deepening one mouth* of the river.† The inner part of Choco gulf, called "Culata del golfo" by the Spaniards, is landlocked, and has deep water, with abundant space. The course of the river is straight; its bed is said to be deep, and entirely free from 'snags,' or such obstructions.‡

The Naipi is, of course, a far inferior river, being a mere tributary; but as loaded boats pass 20 or 30 miles along it in the *dry* season, and as the upper part approaches the Pacific within 6 or 7 miles, it may be regarded as a very available feeder for a canal. It has been asserted, however, that the Naipi is "shallow, rapid, and rocky," which, indeed, at a dry period of the year, and towards the river's source, may be the case; but there is ample evidence to prove that there is always water for loaded barges ('bongos') to a certain place (el embarcadero), which is not much elevated above the sea, and not more than 20 miles from it, without any higher land intervening. On the same (disputed) authority it has been stated that there are "three sets of hills" between the Naipi and the Pacific. This may also be fact, in some particular direction; but the hills that cannot be avoided must be of very little importance, as a Chilian frigate's boat,§ that carried fifteen men, was dragged from Cupica to the Naipi in ten

* When there is moonlight.

† The inundations of this river during the rainy season must be on a great scale, and utterly prevent the establishment of permanent works on the lower banks or in the extensive marshy levels, overgrown with mangroves, bamboos, and impenetrable jungle. Only on the rising grounds can durable foundations be secured. Speaking of one part, Cochrane says, "We scarcely lost sight of huts, but the plantations cannot go into the interior above 50 yards, as the whole beyond that distance is morass."—(*Journal*, March 15; vol. ii. p. 148.) "This country, when the river is at its meridian (mean height?) is about two feet above the level of the water; but when the river rises it is entirely overflowed, leaving the tops of the trees only in sight; and this kind of country, or rather lagoon, extends in every direction."—(*Cochrane*, vol. ii. pp. 452, 453. March 17, 1824.)

‡ Mr. Consul-general O'Leary, writing from Bogotà, last April, says:—"The course of the Atrato is straight, and its bed deep, and entirely free from 'snags,' and such like obstructions."

§ A launch. Watts, MS.

hours, the men clearing a way by cutting the 'bush' as they went along; and as the Indians habitually transported their canoes over the same neck of land.*

From the opinions of those who have written on the subject, founded, as they are, solely on *estimation*, it would appear that the lowest summit level is between 150 and 350 feet above the sea; but all who have visited that district have been passing hastily across it, and have naturally sought the best path—the best *travelling ground*, not the *lowest level*. One exception may be made, in the owner of a large estate on the Naipi,† who may have examined the district more accurately (though, perhaps, with a partial eye). His opinion was, that the lowest summit level was not elevated more than 160 feet.‡

There can be little doubt that in the vicinity of watercourses, including that which leads into Cupica bay, a line may be carried *thence*—to the Atrato, if not to the Naipi—which would be suitable for a large canal. Such a project is by no means new. It was suggested to the Spanish government by a very intelligent Biscay pilot, Gogueneche by name, at an early date (when Spanish pilots were sailing masters); but so cautious were the Spaniards to prevent rather than encourage any scheme that might facilitate access to the west coast of America, or extend a knowledge of the mining localities near the Darien gulf, that it was prohibited, *on pain of death*, not only to navigate the Atrato, or pass by that river, but even to *propose* to take advantage of it, in any way, as a route.§

* Watts, MS.

† Señor Coutin.

‡ Watts, MS.

§ "En tiempo de Felipe II. se proyectò cortarlo, y comunicar los dos mares medio de un canal, y a este efecto se enviaron para reconocerlo dos ingenieros Flamencos; pero encontraron dificultades insuperables, y el consejo de Indias representò los perjuicios que de ello se seguirian a la monarquia: por cuya razon mandò aquel Monarca que nadie propusiese o tratase de ello en adelante, *pena de la vida*."—Alcedo, *Diccionario Geografico Historico de las Indias Occidentales*, &c. Ad verb Istmo.

ENGLISH TRANSLATION.

In the time of Philip II, it was contemplated to cut a canal, and by this means to join the two seas: and to this effect two Flemish engineers were sent to reconnoitre it, but they found insuperable difficulties, and the Council of the Indies represented the evils which therefrom would accrue to the monarchy, for which reason that Sovereign ordered, *under pain of death*, that nobody should thereafter propose or entertain the subject.

"Es navegable por muchas leguas pero esta prohibida la navegacion con *pena de la vida*, sin excepcion de persona alguna; por evitar los perjuicios que se seguirian a las provincias del nuevo Reyno, por la facilidad con que se podrian internar por el."—Alcedo: ad. verb Atrato.

ENGLISH TRANSLATION.

It is navigable for many leagues, but the navigation of it is prohibited *under pain of death*, without the exception of any person whomsoever, to obviate the evils which might accrue to the provinces of the New Kingdom, from the facility with which one would be enabled to penetrate it.

This was not done solely to isolate the western colonies. It was with a view to protect them from the incursions of piratical invaders; from the notorious buccaneers especially, and to keep secret the situation of the richest gold-mines.

The British Consul-General at Bogotá (D. F. O'Leary), writing on the 24th of last September, gives a report made to him by an engineer employed by the government of New Granada (M. Greiff, a Swede), of which the following interesting passages are *extracts* :—

"No river in New Granada offers greater facilities for steam navigation than the Atrato; and even under sail it can be ascended during the summer months (the dry season) above the mouths of the Naipipi. Of the seven or eight mouths of the Atrato, the one called Coquito is the best for navigation,* and its bar can easily be kept free from obstructions† which in the other mouths prevent the entrance of large vessels.

"The banks of the Atrato throughout its whole course are subject to inundations, excepting (on the left bank) the slopes of Cucericá, six or seven leagues from its mouths, which are fit for building upon. On the right bank the slopes of Tūmurado and Pulga would allow of small buildings for depôts.

"The Indians pass from the mouth of Tarena, by the river Arquia, to the Cordillera, carrying over their canoes to the river Paya, and descend by it to the gulf of San Miguel, on the Pacific. A similar operation is performed by the Truando and other rivers, with more or less difficulty.

"The banks of the rivers Domingado and Apagado, to the left of the Atrato, are inhabited, and generally cultivated. They produce cocoa, plantains, and maize; and there are several herds of cattle. The Naipipi, for a considerable distance, is easily navigable even for large vessels; and I think that the greatest impediment consists in the number of *snags* which are in *this smooth river*. At present, persons ascend in canoes for two days, and require half a day to go to Cupica by land, at the rate at which the natives travel, about three leagues each day. On the banks of the Naipipi there are beautiful pasture-lands, and cattle; the land is generally capital; some of it is planted with cocoa. The banks of all the tributaries of the rivers Naipipi and Apagado are fit for cultivation, and population; but those of the rivers running into the Pacific are still better, and principally those of the river Truando, where there is a settlement of runaway negroes and Indians, who are occupied in boat-building, cultivation, and in the pearl-fishery.

"In Naipipi, Apagado, and Truando there is plenty of mahogany and other valuable wood.

"A great part of the tract of land between the Atrato and Pacific is most advantageous for population; and the climate, although hot, is

* In 1823-4, Candelaria was the deepest, but Barbacoa the best, of nine mouths of the Atrato.—*Cochrane*, vol. ii. p. 455.

† Mud, sand, and trees.

sufficiently healthy. The Atrato itself swarms with insects and reptiles; but, as you recede from it towards the sea, the whole of the slopes, even to the coast, are good for use."

In this vicinity, if our premises are correct, and the climate can be withstood (neither of which there is good reason to doubt), we may suppose that a great canal is feasible, and that there is a substantial foundation for opinions in favour of attempting to execute such a work on a scale that would make it available for the largest ships of all nations.

For a railroad, or even a waggon-road, the neighbourhood of the Atrato cannot be suitable, because of the extensive swamps and low marshy land affording no solid foundation, and often inundated; which is said to be characteristic of both banks in some places. Roads can undoubtedly be formed more advantageously elsewhere;—by *this* line an effective communication can only be made by water.

The four principal lines have been thus summarily examined; and the result is, that only one, the Cupica and Atrato route, appears now to offer a reasonable prospect of encouragement to undertake the construction of a *ship-canal*; and that only one other route—that from Portobello, or from Manzanilla, to Panama—seems likely to become the site of a great permanent road for *general traffic*, if not for a *railway*. The other two routes seem unlikely to be adopted, except for *local objects*.

Referring now to the other lines *suggested*, but not yet sufficiently explored—Between *Chiriqui* lagoon and *Dulce* gulf a communication has recently been proposed by a French company, who have obtained a grant of land from the government of Costa Rica. Their object is said to be the establishment of a good road, in the first instance, between the lagoon of Chiriqui and the gulf called Dulce. Whatever may be the character of the intermediate district, or the extent of country to traverse, it is certain that the two points of departure are good ports—a very material advantage with which to commence operations.

Between the Panama line and that by the Atrato there are at least *three* places where surveys are very desirable; namely, from San Blas, or Mandinga bay, to near Chepo; from Caledonia bay to the gulf of San Miguel; and from that gulf to the southern part of the gulf of Darien, called Choco.

As these routes have been so little explored there is not much definite knowledge about them. Mr. Hopkins was lately prevented by the Indians from ascending the Chepo river towards Mandinga, or San Blas bay;* and Dr. Cullen was stopped likewise by the aborigines while endeavouring to ascend the Paya

* Mr. Wheelwright was stopped also there, in 1857.

river, that runs from near the mouths of the Atrato to the Tuyra, which falls into the gulf of San Miguel.

The narrowness of the isthmus between Mandinga, or San Blas bay, and Chepo, and the refusal of the aboriginal Indians to allow of its examination, are incentives to explore the locality. From sea to sea there are about 27 miles. San Blas bay has ample harbourage; and the natives *drag canoes across* from the Concepcion, or Mandinga river, to the Chepo, which rises near the north coast. But there is no port at the mouth of the Chepo; on the contrary, a long extent of flat shoal is uncovered at low water, which prevents the approach of ships nearer than *four miles*.

Farther eastward are the tracks from Caledonia bay to the gulf of San Miguel; one of which Wafer travelled in 1681, with other buccaneers, to attack the Spanish mining villages of Santa Maria and Cana. The river then called Santa Maria is the same as the Chuquanaqua (if not the Savana), which rises about eight miles from Scotch harbour (Port 'Escoces'), in Caledonia bay. There is a range of hills between them, which the buccaneers (who, intending to *surprise* the Spaniards, did not take the *usual* track) found difficult to cross. There is also good reason to suppose that the Indians did not willingly show the best paths to their rather dangerous allies.

Any route that could be made available between San Miguel gulf and Caledonia bay, or the gulf of Darien or Choco, would have the advantage of excellent harbours at each end, and a great rise of tide in one of them (San Miguel). The river Savana is recommended by Dr. Cullen, from personal examination, as being more navigable (for canoes), and approaching nearer the north coast than the Chuquanaqua does; though this does not appear in the Spanish maps.* From the head of the Savana, a ravine, about three leagues in length, extends to Caledonia Bay, and there (Dr. Cullen says, having passed through it), *he* thinks, a canal might be cut with less difficulty than elsewhere, if it were not for the opposition of the natives. He also speaks of the Indians transporting their canoes across at this ravine; and of the comparative healthiness of this part of the isthmus.

Doubtless, the unhappy Scotch colony (of 1695-1700), so well planned, but so cruelly betrayed and ill-treated, had good reasons for selecting that part of the isthmus for their settlement, having obtained the fullest information from Wafer and other buccaneers.

* The Savana rises near Caledonia bay, and runs into the Tuyra, to the westward of the Chuquanaqua. Access from the sea, in San Miguel gulf, to the immediate vicinity of Port Escoces (Scotch bay), is said to be easier by this river than by the Chuquanaqua. Dr. Cullen traversed this space very recently, and states that a valley leads from Caledonia bay to the Savana, in which valley the lowest summit level does not exceed 400 feet (by his estimation) above the sea.

The locality was so much liked by the Scotch adventurers that, even after their utter ruin and dispersion, the leaders (in particular Paterson) wished and endeavoured to organise another expedition to the same place. In those days much gold was obtained near San Miguel gulf. The climate of the higher grounds was pleasant; and the soil was remarkably fertile. General commerce with the Indies and Europe, slave trade with the Spanish colonies, and obtaining gold from the neighbouring mines, were no doubt chief inducements to the Scotch colonists; *besides opening a way through the Isthmus, which there is so narrow.* One of the adventurers in the Scotch enterprise speaks of the harbour of New Edinburgh (as it was then called) and the adjacent district in the highest terms of praise, saying, among other things, "We have already had Dutch, French, and English, all at the same time in our harbour; and all of them wondering what the rest of the world have been thinking about while we came here to the best harbour in the best part of America.* The soil is rich, the air temperate, the water sweet."

Very rich mines were then worked in that vicinity; but, so harassed were the Spaniards by repeated incursions of the buccaneers, by the Indians, and by the alarming attempt of the Scotch to colonise so close to the real 'El-dorado,' that early in the last century the mines of Cana and others in the neighbourhood were concealed and abandoned. The miners and their strong guards of soldiers were withdrawn, and all the forts dismantled. No traces of Cana are visible. Santa Maria is likewise overgrown and hidden. Only a few straggling gold-washers now visit that neighbourhood occasionally.

Between the bottom of the gulf of Darien (or Choco) and San Miguel there may be means of effecting a good passage by land as well as by water; but this tempting situation—low, narrow, nearly intersected by rivers, and lying between excellent harbours—has not lately been explored. The rivers Paya, Cucarica, and Atrato are here in close proximity; and near, likewise, to the situation of the most famous mines, those of Cana. The Tuyra runs into the gulf of San Miguel; the Paya into the Tuyra; and the Cucarica, besides other small rivers, into the Atrato. Near the sources of the Tuyra were the very rich mines of Espiritu Santo, said to be the richest gold mines then worked in America.

Probably, the climate in these low woody regions is very deleterious; however innoxious it may be on the heights or on the open sea-shore. Indeed there must be some permanent local difficulties of a serious character, that have assisted the Spaniards

* History of Caledonia, or the Scots Colony in Darien. London: 1699.

and the Indians in keeping curious travellers out of such rich districts, otherwise they would have been peopled (and ransacked like California) ages ago. On all accounts, however, this is an extremely interesting quarter, highly deserving of exploration.

With a few general observations this paper shall be concluded.

Of all the comparatively well-known routes, it has been shown that the Atrato and Cupica line seems the most suitable for a canal, and the Panama route for a railway or road; and that, of other less explored tracks, the most promising are those between the gulf of Darien and San Miguel.

Captain Moorsom acquaints us that the great Humboldt (after half a century of active interest in this subject, and after accumulating and digesting infinitely more information about Central America than any other person), "is thoroughly satisfied that the Isthmus of Darien is superior to any other portion of the entire neck for a canal." And to an opinion, nearly similar, it may be presumed that unprejudiced persons will now generally come; but until surveys are effected, and indispensable details of information obtained, it will not be possible to arrive at any certain conclusion.

Climato and *natives** are at present the only serious impediments to a regular survey, or examination with measurement. Is it not then advisable to make terms with those natives without delay; to choose the proper season for exploring; and to refrain from compromising capital as well as character by supporting any undertakings not based on sufficient information, and that do not, even in the outset, afford any reasonable hopes of a result in any manner remunerating? Exact descriptions and very careful measurements are indispensable before any great work can be judiciously begun, but they have not yet been executed throughout the whole extent of any line, except one.

Whatever may be the physical obstacles to either a canal or a

* A reply was lately made to the British consul at Panama, by a young Darien Indian, who had lived in his house for some time, that if the consul (Mr. Perry) attempted to pass through his country, he would be "the first to drive a poisoned arrow" into him.—(*Litt.*, pp. 37, 38.) The determined opposition made by natives of the same neighbourhood, if not of the same tribe, to the attempt of Mr. Hopkins to ascend the Chepo, and Dr. Cullen the Paya river—the precautions adopted in navigating the Atrato—(*Cochrane*, vol. ii. p. 455)—besides many similar instances, show that an intricate question is to be solved in that quarter, before even a survey can be made. In Choco there are other Indian aborigines, usually at war with those of Darien, and with the descendants of the Spaniards.^a

^a March 18, 1824.—Passing down the river (Atrato) we saw the high land inhabited by the Cuna Indians, of whom the boatmen were formerly much afraid, as they frequently waylaid them, and, putting all the crew to death, by a flight of arrows, captured the vessels, and carried off the booty.—*Cochrane*, vol. ii. p. 453.

railroad between any places in Central America, it appears to be indisputable that the insalubrity of the climate, and the excessive quantity, as well as frequency and duration of rain, are the impediments most permanently formidable.

Whether we look at Humboldt's accounts of the inundations in Mexico, or reflect on the scanty and dispersed population of districts so rich and fertile as those of Choco and Darien, the mind is struck by the excessive difficulties which such a climate superadds to any work of man.

It is not that the transit of passengers, or even of ships, will be materially affected by these causes, when once an easy, and therefore rapid means of transit is secured ; but it is the health of those who must be *permanently* employed there, throughout the whole year, that is so weighty a consideration.

In Central America there are two seasons, one of which, though called winter, is when the sun is nearly vertical : and the opposite period, when the sun is not so high at noon, is the summer ; in which hot and dry weather prevails, accompanied by a clear and healthy air. In the northern parts of the Isthmus the dry season lasts longer than about Darien and Choco, where there are only short intervals without some rain. About three months in the year can alone be depended on, as dry and truly fine weather, in the vicinity of the Gulf of Darien. At that time regular breezes prevail from the northward and eastward, interrupted though occasionally by gales from the north. In the season called winter the sun is seldom seen, so clouded is the sky, and so frequent are the torrents of rain. The air is then extremely sultry. Lightning and thunder are very frequent, and westerly winds, with hard squalls, are prevalent. There is a short interval of fine weather in the middle of the rainy season, near the end of June (called the little summer of St. John), but the regular and continued summer, a very dry and parching time in the northern parts of the Isthmus, lasts from December to April or May, in which period *only* could extensive operations be carried on advantageously.

With respect to salubrity, there is no doubt (as has been previously mentioned) that in low places, near rivers especially, where fresh and salt waters mix, where mangrove trees abound, and decomposition is rapid, the climate is very unhealthy—often fatally so ; contagious miasmata of sulphuretted hydrogen and carbonic acid gas being abundant. But in higher regions, where the ground is less hidden from the sun and wind, and noxious vapours are not generated, there is nothing in the climate to injure a healthy European, who lives temperately and avoids extremes.

Among all the travellers, seamen, and other adventurers, who have been for some time much exposed in those places, very few

lost their lives there, though many have had ague or fever—some the dangerous yellow fever, or other maladies. Nevertheless, unseasoned white men cannot, generally speaking, work hard in that climate, exposed to sun or rain, like men of colour. They cannot labour in the muddy banks of the tropical rivers, in cane or mangrove swamps, or on exposed and scorching rocks. Their health would inevitably give way, however vigorously a few hardier constitutions might persevere for a time. This consideration militates against the employment of European convicts, and should induce the engagement of acclimatised persons (if not of colour) to superintend, as well as to execute, undertakings of magnitude.

Ordinary labourers must be sought among the darker varieties of the human race. They may be obtained from several places in the West Indies, from the United States, from the Kroo coast of Africa, and Liberia; from the Philippine Islands, China, Polynesia, the East Indies, and various parts of America. Of all these, the Kroo men and the Chinese would probably be the most industrious and manageable. On the correct treatment of labourers and their equitable and prompt payment, very much would depend; but this branch of the subject demands separate consideration. Next to the supply and management of adequate funds, it is the most important auxiliary.

In this summary review an impartial examination of advantages, as well as obstacles, has been freely attempted. In conclusion, it may be observed that no memorial of the power of human skill and exertion—not the Mexican ‘Desagüe,’ nor the wall of China, nor the pyramids of Egypt, would be more remarkable: while in practical and general utility to the whole world no other physical undertaking would bear comparison with such an achievement as a ship-canal.

The immense increase of easy, rapid, and popular communications between regions no longer remote—the wide diffusion of knowledge; and the spread of Christian civilization—would undoubtedly be the inestimable consequences of forcing the barrier of Central America.

Of results so amply and so eloquently foretold by authors of established reputation, it would here be superfluous and presuming to say more than to express a patriotic hope that Great Britain will achieve them—and will then throw open the grand work for the permanent benefit of the world.

LIST OF AUTHORITIES.—Admiralty (Hydrographic Office); Alcedo; Baily; Burney; Byam; Chevalier; Cochrane; Coutin; Cullen; Dampier; Davis; Edwards; Falmarc; Galindo;

Galisteo ; Garay ; Garella ; Guzman ; Hamilton ; Hopkins ; Hughes ; Jefferys ; Juan ; Lawrence ; Liot ; Lloyd ; M'Queen ; Mollien ; Morel ; Louis Napoleon ; O'Leary ; Pitman ; Purdy ; Scarlett ; Stephens ; Squier ; Ulloa ; Wafer ; Watts ; Wheelwright ; Wood :—besides the standard works of Humboldt ; and old as well as modern charts and maps.

Note upon the Language of Central America.

By R. G. LATHAM, M.D.

IN Yucatan the structure and details of the language are sufficiently known, and so are the ethnological affinities of the tribe who speak it. This language is the *Maya* tongue, and its immediate relations are with the dialects of Guatemala. It is also allied to the Huasteca spoken so far N. as the Texian frontier, and separated from the other *Maya* tongues by dialects of the Totonaca and Mexican. This remarkable relationship was known to the writers of the *Mithridates*.

In South America the language begins to be known when we reach the equator ; *e.g.* at Quito the Inca language of the Peruvian begins, and extends as far south as the frontier of Chili.

So much for the extreme points ; between which the whole intermediate space is very nearly a *terra incognita*.

In Honduras, according to Colonel Galindo, the Indians are extinct ; and, as no specimen of their language has been preserved from the time of their existence as a people, that state is a blank in philology.

So also are San Salvador, Nicaragua, and Costa Rica ; in all of which there are native Indians, but native Indians who speak Spanish. Whether this implies the absolute extinction of the native tongue is uncertain : it is only certain that no specimens of it are known.

The Indian of the Mosquito coast is known ; and that through both vocabularies and grammars. It is a remarkably unaffiliated language—more so than any one that I have ever compared. Still, it has a few miscellaneous affinities ; just enough to save it from absolute isolation. When we remember that the dialects with which it was conterminous are lost, this is not remarkable. Probably it represents a large class, *i.e.* that which comprised the languages of Central America *not* allied to the *Maya*, and the languages of New Grenada.

Between the Mosquito country and Quito there are only two vocabularies in the *Mithridates*, neither of which extends far beyond the numerals. One is that of the dialects of Veragua called *Darien*, and collected by Wafer ; the other the numerals of the famous Muysca language, of the plateau of Santa Fé de Bogota. With these exceptions, the whole philology of New Grenada is unknown, although the old missionaries counted the mutually unintelligible tongues by the dozen or score. More than one modern author—the present writer amongst others—has gone so far as to state that all the Indian languages of New Grenada are extinct.

Such is not the case. The following vocabulary, which in any other part of the world would be a scanty one, is for the parts in question of more than average value. It is one with which I have been kindly favoured by Dr. Cullen, and which represents the language of the Cholo Indians inhabiting part of the Isthmus of Darien, east of the river Chuquanaqua, which is watered by the river Paya and its branches in and about lat. 8° 15' N., and long. 77° 20' W. :—

ENGLISH.	CHOLO.	ENGLISH.	CHOLO.
Water	<i>payto</i>	Tiger, i.e. jaguar	<i>imānd</i>
Fire	<i>táboor</i>	Leon, i.e. large tiger	<i>imānd pcoros</i>
Sun	<i>pesea</i>	River	<i>thō</i>
Moon	<i>hedecho</i> *	River Tuyra	<i>tōgūrooma</i>
Tree	<i>pachru</i>	Large man	<i>mochinā dēāsira</i>
Leaves	<i>chitāha</i>	Little man	<i>mochinā zache</i> *
House	<i>dhē</i>	An iguana	<i>ipōya</i>
Man	<i>mochinā</i>	Lizard	<i>horhe</i> †
Woman	<i>wuēna</i>	Snake	<i>tamā</i>
Child	<i>wōrdōchē</i> *	Turkey, wild	<i>zāmo</i>
Thunder	<i>pā</i>	Parrot	<i>carre</i>
Canoe, or	<i>habodrooma</i>	Guacharaca bird	<i>bulleebulle</i>
Chingo		Guaca bird	<i>pavōra</i>
		Lazimba	<i>toosee</i>
	The tide is rising	<i>tobirooor</i>	
	The tide is falling	<i>eribudo</i>	
	Where are you going	<i>amonga</i>	
	Whence do you come	<i>zamatima zebuloo</i>	
	Let us go	<i>wōnda</i>	
	Let us go bathe	<i>wōnda cuidee</i>	

The extent to which they differ from the languages of Venezuela and Colombia may be seen from the following tables of the words common to Dr. Cullen's list, and the equally short ones of the languages of the Orinoco:—

English	<i>water</i>	English	<i>moon</i>
Cholo	<i>payto</i>	Cholo	<i>hedecho</i>
Quichua	<i>enu, yam</i>	Quichua	<i>quilla</i>
Omagua	<i>uni</i>	Omagua	<i>yase</i>
Salivi	<i>cagua</i>	Arawak	<i>Cattehee</i>
Maypure	<i>neru</i>	Yarura	<i>goppe</i>
Otomaca	<i>ia</i>	Betoi	<i>teo-ro</i>
Betoi	<i>ocudū</i>	Maypure	<i>chejapi</i>
Yarura	<i>wi</i>	Salivi	<i>verio</i>
Darien	<i>dalah</i>	Darien	<i>nie</i>
Carib	<i>touna</i>	Zamaca	<i>ketokhi</i>
English	<i>fire</i>	English	<i>man</i>
Cholo	<i>táboor</i>	Cholo	<i>mohina</i>
Quichua	<i>nina</i>	Quichua	<i>ccari</i>
Omagua	<i>tata</i>		<i>runa</i>
Salivi	<i>egustā</i>	Salivi	<i>ecoco</i>
Maypure	<i>catti</i>	Maypure	<i>cajarrachini</i>
Otomaca	<i>nina</i>		<i>mo</i>
Betoi	<i>futui</i>	Otomaca	<i>andera</i>
Yarura	<i>coride</i>	Yarura	<i>pumē</i>
Carib	<i>onato</i>	Muysca	<i>muyaca</i>
English	<i>sun</i>	Carib	<i>cha</i>
Cholo	<i>pesea</i>		<i>oquiri</i>
Quichua	<i>inti</i>	English	<i>woman</i>
Omagua	<i>huarassi</i>	Cholo	<i>wuēna</i>
Salivi	<i>numesuchecoco</i>	Quichua	<i>huarmi</i>
Maypure	<i>chiē</i>	Maypure	<i>tinioki</i>
Betoi	<i>teo-umasoi</i>	Yarura	<i>ibi</i>
Yarura	<i>do</i>		<i>ain</i>
Muysca	<i>auā</i>	Betoi	<i>ro</i>
Carib	<i>veiou</i>	Otomaca	<i>ondua</i>

* *ch* as the Greek χ .† Pronounced as *Jorge* is in Spanish.

XIV.—*Tibet and Sefan*.—By Dr. CH. GUTZLAFF, Corresp. M. R.G.S. Communicated by Sir George Staunton, Bart., M.P.

[Read Feb. 12 and 26, 1849.]

TIBET, situated on the highest plateau of Asia, and encompassed by the most stupendous mountains of the globe, is a wonderful country. Its confines extend from China and India to the Mohammedan countries of Western Asia; and it is styled the Land of Marvels, of extraordinary rivers and lakes, interspersed with few fertile spots, possessing a scanty population, a dry cold climate, few vegetable, but numerous mineral productions. It is, as it were, a territory where extremes meet, and where everything is extraordinary. The inhabitants, not satisfied with their strange country, have strongly contributed to enhance the wonderful by their curious mode of life and their creed. In mockery of common sense, a preposterous superstition has been established, in which the people have joined with fervour and the most ready self-denial. It may, in fact, be termed the sacred land of Shamanism, which the roving Mongol of the desert regards with soul-inspired awe, and whither the priest of the steppes makes his pilgrimage. Wrapped up in itself, Tibet remains impervious to civilization and progress. Its hardy mountaineer, instead of wielding the scimitar, has adopted the crosier, and by this means assumes a more important part in the history of Central Asia. In a barren country, where every inch of productive soil must be carefully cultivated in order to afford a scanty harvest, the inhabitants consider a life of laziness to be the highest bliss, and look upon labour as a disgrace. The imaginary spiritual advantages, thus obtained, reward them for the maintenance of innumerable priestly drones.

The relations of Tibet with Hindostan have merely been of a religious nature. No conqueror of the South, however insatiable his lust for foreign acquisitions, has ever succeeded in obtaining possession of this magic land. On the other hand, the connection with China, seemingly broken by stupendous mountain ranges, has continued, and the Celestial Empire to this day maintains a strong political ascendancy over the country. The Mongols, once the conquerors of Asia and of Eastern Europe, are now the devoted slaves of the Tibetan hierarchy; and a word from a Lama, or denunciation from L'hassa, will cause the proudest of them to tremble. A Khan even, with 10,000 lances at his command, will bury his head in the dust at the sight of one of these holy priests.

Tibet borders to the N. on Kokonor, the Desert of Cobi and Eastern Turkestan; to the S. on Yunnan, the nominal

territory of Birmah, the wild land of the Abor tribes and Assam, the possession of the Sikhim Rajah, the British territory with the Punjab, and a small part of Afghanistan; to the E. it borders on Sefan; and to the W. on Cashmere and Badakshan. Its most southern point towards Birmah may be fixed at 27° lat.; its most northern in Little Tibet at 35° ; its western at the Hindoo Cosh, in 70° ; its eastern in Sefan in 100° E. long., Greenwich.

The north-eastern frontiers, participating in all the horrors of the Cobi desert, are but ill defined. The Chinese line of demarcation is perhaps the most correct. For about 80 geographical miles a ridge of mountains runs from E. to W., beyond which, on the side of Kokonor, we meet several lakes and salt marshes, with no less than seven streams, descending in a north-easterly direction, and losing themselves in the parched soil of the desert. Farther W. the mountains become more numerous, and run N. and S. Here and there a few nomades may be seen shortly after the rainy season, with their herds browsing on the scanty herbage; or a caravan of pilgrims may be met on their way to L'hassa. The more distant from Kokonor the more solitary becomes the desert, until it ends in one vast ocean of sand. It penetrates several degrees into Tibet, as far as the Tenkiri lake, where a ridge of mountains protects the country from the boisterous storms of the N. No caravan ever crosses this region, abandoned by man and beast, and doomed to everlasting solitude.

The N.W. frontiers present a different aspect. The soil is here hard enough to admit of roads; and villages now and then occur. Mountain-ridges still rise, but there is more verdure; and the approach to Yarkand, Cashgar, and Khoten, is announced by the appearance of civilised life. Some geographers have carried the northern point of Little Tibet to 40° lat. Beyond 35° , however, the various tribes of the Hindoo-Coosh disclaim all connection with Tibet; and Chinese writers do not include this territory in their maps of the same.

The southern frontier is more varied. The inhabitants of Laos glory in their undisturbed independence. Chinese writers mention with the utmost horror their barbarous customs, and represent their manners as disgusting in the extreme. No lama dares approach their abodes, and Bhudda himself would be hurled down the rocks if he ventured to obtrude his creed on these wild tribes. With Tibet there exists scarcely any connection, but there is some little intercourse with the South. Against the inroads of these tribes a fortress (Turkepoona) has been built, containing a large walled enclosure, whither the country people, in case of danger, may fly to save their lives and property.

Farther W., according to Chinese maps, runs, for a distance of more than 100 geographical miles, the Naetsoo river (Ludnagh-tseu), into which flows, from the North, the Moktsoo, forming the boundary between these hill-tribes and Tibet, parallel to the frontier of Assam. The Naetsoo may possibly be identical with the mighty rapid, which forces its way through the famous cleft (Prabhu Kuthan), so celebrated in Brahminical lore. The sources of the Brah-mapootra are in the Borkhampti country; and the Naetsoo may turn out to be one of the principal feeders, which joins it immediately on the frontiers, in a region of ice and snow. In a country where so many streams descend the mountains through narrow defiles, it is difficult in the extreme to point out with accuracy the sources of the rivers. So great a river as the Naetsoo must, however, be known in its southern course under some denomination or other.*

The hill-tribe, having most intercourse with Tibet, is the Mismee, a somewhat more civilised race than those more to the East, but not under the rule of the Lamas. They carry on a kind of barter, and import a few Tibetan and Chinese manufactures. The Singphos are a warlike people, in some degree confessing Budhuism, while their Laos origin is evidently proved by the similarity in language. These and the Miamareas are the principal tribes that inhabit these mountains. Farther West we find the wild Abors. The Darmotsang and Muntsoona fortifications are built near a bend of the Naetsoo, more accessible to Tibet. The Tibetans comprise the hill-tribes under the general name of Mon, and call Assam, Ashong. Sediya is the nearest British station.

Bhootan constitutes one link between Hindostan and Tibet. Its length is about 220 geographical miles; its breadth about 90; and it contains an area of 19,800 geographical square miles, extending from the $26^{\circ} 30'$ to the 28° N. lat., and from $88^{\circ} 45'$ to $92^{\circ} 25'$ long. E., Greenwich. The country is scantily inhabited, and the population differs little in appearance from that of Tibet.

To the N. of Bhootan, beyond the 28° of lat., and to the W. of the Naetsoo, a considerable space of barren and hilly country is occupied by a savage tribe, known under the name of H'lokba, upon whom the Lamas have as yet been unable to make any impression. Tardszong, on the E. bank of the Naetsoo, is built as a defence against their invasions. The frontier is marked by the bright peaks of three mountains, the Charmoktar, Charmok-chong, and Tarpal, which may be seen at a great distance glittering in the sun. To the N. and W. the extensive plateau

* Perhaps the Dihong.

of Tibet commences; and to the E. the mountains run parallel with the frontiers.

The boundaries towards Nepaul are remarkable for several lakes, of which the Korlatsoo and the Charmoktsoo are the two principal. Pharidsong is built here against the encroachments of the Bhooteas. The name of this place is derived from a river, which flows some distance in a southerly direction along the frontiers, and joins another under the name of Mingtsoo. Beyond it the Tsaringkitna-kang-chong and the Choumoulankma peaks indicate the Tibetan territory. Traffic is carried on through the Soomoonan Pass, on crossing which a number of rude flags are seen serving as a line of demarcation. The first place reached is Pharidsong (just mentioned), in the neighbourhood of which is a large convent, the residence of many Lamas. The natives all around are nomades, and possess considerable herds of cattle. The Chinese, having gained the ascendancy in Tibet, selected Phari as the most important frontier-town of the S.E., and adopted the most restrictive system against foreign intercourse. A strong body of natives and a few Manchoo troops are quartered in the fortress, and the commanding officer is responsible with his head for the admission of strangers.

The Sikhim frontier* extends between the Teetsa and Konke rivers. The former has been already mentioned under the name of Mingtsoo; and the latter forms part of the boundary towards Nepaul, and is called in Tibet the Newtsoo. Notwithstanding high intervening mountains, there is a considerable intercourse with the latter country, and a great part of the inhabitants revere the Dalai-Lama as their spiritual lord. A Chinese military station has been lately established on the northern banks of the Newtsoo, and the government watches with great care any movements of foreigners. The British sanatory station of Darjeling is too well known to need here any description. The Nepaul frontier is of considerable importance. Its most northern point lies in 31° ; its southern in 27° lat.; and its whole length is about 460 English miles. The Newtsoo winds its way through a fertile valley, and the access to Tibet may be here considered easy. Three fortresses, Yunghar, Niolmas (or Nečlamüh, in Chinese), and Chiron, are built along the banks as a protection against the inroads of the Ghorkas. Farther W. no such precaution is necessary, the mountains (amongst which the Dhwa-balagiri is the most renowned) serving as a sufficient protection against any enemy. The peaks of this range are so remarkable that the Chinese carefully enumerate them on their maps as the Partsun, Kang lawatseën, Kang pang tseën, Sik look kangmok, Chaou too

* See map of Sikhim in the first part of this volume, by M. Petermann.—Ed.

leët, Chok nane kangtseën, Lalook kang tseën, Mane yunikang tseën, Kung kang tseën, and the Saetal. Not a single stream breaks through the mighty range, but many descend its sides, and feed the great rivers of Tibet. In the mountains are found aboriginal tribes, of whom little is known, excepting that the Magars and Gurungs have been in some measure converted to Shamanism.

The portion of Tibet immediately bordering on British India has been minutely described by others; but the Chinese have no clear idea of the frontiers of their mighty neighbour. Along this boundary rise several remarkable but inaccessible peaks, such as Charchar-tset-she, Kae-chaou-kang-tseën, Tarmok-chok-karpapoo, and Lang-chin-pa-kir-poo. The first station, Gotorpe or Garoo, is a mere encampment, in $31^{\circ} 8' N.$ lat., and $80^{\circ} 24' E.$ long. The country around is inhabited by nomades. The Mapadalaë and Langka lakes, celebrated in Hindoo mythology as Manasarovara and Rawan's-Hrad, are worthy of notice. The sources of the Indus, Ganges, and the Dsangbo, three of the most remarkable rivers in Asia, are here found. The cities Korne-tomak, Ari, and Teti lie towards the W., and constitute the frontier towns in that direction. They are of considerable size, and are defended by solid walls and strong garrisons.

The sources of the Indus are supposed to lie in $31^{\circ} 20' N.$ lat., and $80^{\circ} 30' E.$ long. If such be the case, the Kang-kö Ganga, after its junction with the Matsoo (along which the above cities are situated) may possibly turn out to be identical with the Indus. No other large stream here flows towards the S.; and should the latter not be the principal branch of the Indus, the question must naturally arise, what becomes of the immense quantity of water conveyed by the Kang-kö towards the S.? Moorcroft's information upon this point appears to be very correct.

Beyond the eastern portion Chinese influence becomes merely nominal, and Western Tibet can scarcely be considered under the Celestial sway. The frontier continues very mountainous, and the Kang-kö runs behind the mountains.

The eastern frontiers have not yet been described by any European. Chinese maps profess to delineate boundaries which in reality are but ill defined. According to these authorities, the Lanstang river, rushing down from Sefan, forms for some distance the frontier. This part is covered with mountains, and inhabited by the Noo tribe. Tibet borders upon the Laton country, inhabited by a people not dissimilar from their polished neighbours, and imbued with the doctrines of Shamanism. The Kin-sha (Yang-tsze) runs not far from the boundary, and the intervening territory is of narrow dimensions. On the Tibet frontier the land is without any cities, while on that of Sefan a

dense population, divided among various tribes, the principal of which are called the Patang and the Hwasutma, exist under native chiefs nominated by the Chinese government. Farther inland some towns are found, and the numerous streams all join the Kin-sha.

The north-eastern frontier in 31° lat., is wild and mountainous. Towards Kokonor lie the Tungpa and Tsangyupane principalities. The Chatsoo forms at the 32° the boundary, and runs subsequently through the Tibetan territory.

The difference between Chinese rule and that of the hierarchy of Tibet is striking. The inhabitants of Sefan are an unruly race, but Chinese policy has trained them to docility and industry. As soon as you enter the territory where Chinese influence is felt, order, observance of the laws, and security of property are observed.

The south-eastern boundary towards Cashmere is well defined, and has been accurately described; but the frontier towards the Indian Caucasus is less known. In Badak-shan various tribes mingle together in an extremely wild country, little known, and scarcely visited by Europeans. The N.W. range of the Himalaya forms the boundary up to the 33° lat., and the land thence stretches towards the E. about 140 geographical miles to the Pabälake and the Belour-tag. Beyond this all frontier lines are unknown.

The Dhawalagiri, 27,000 feet in height, is considered as the most lofty upon earth, but the mountains on the eastern side of Tibet, constituting the vertebræ of this great continent, may possibly prove still superior. The peaks of the Salpoo group vary from 15,000 to 24,000 feet, and those of the Dhayadung from 14,000 to 17,000.

The lower passes are accessible during a few months only of the year. Even here the traveller encounters the greatest dangers, and a snow-storm in July, an avalanche, or a sudden change in the temperature, has often destroyed whole caravans, and the frozen bodies of the sufferers remain as statues, warning adventurers to hasten on. All these difficulties have, nevertheless, been overcome at times by Chinese perseverance; and not only caravans, but even whole armies, with guns in their trains, have performed exploits far superior to the undertakings of Hannibal or of Napoleon.

The northern chain, extending through the 31° lat., is broken by several lakes. Though not exceeding 3000 feet in height, the mountains serve as a protection against the shifting sands of the desert, which, propelled by strong winds, would soon cover the country to the South, and convert the adjacent territory into a desert. The principal range East of the Tenkiri lake is the

Youk, running in a north-easterly direction. Thence towards the West the country becomes flat, and a number of lakes with small connecting streams cover the surface. Of the frontier range the Tarkoo is best known. This chain, hitherto inclining towards the S.W. as far as the 31° lat., now turns to the N.W.; and the Sharak mountain, in about 32° lat., forms a good landmark. From this point the lakes are again continued in a more southerly parallel; while farther North, in the 33° lat., an outer line of circumvallation has been formed by the accumulated sands, leaving an intermediate space of nearly 2° of latitude almost a desert. The highest peaks are the Dsadsa, Chak, and Kenkrimuson. The north-eastern range presents still less difficulty of access, and the Chala and Noopra mountains are comparatively low.

In the eastern parts of Tibet the mountains run S., with extensive plains and valleys between them, especially along the banks of the Dsangbo. The Nomkhoun-oubashe chain is N. of L'hassa; the Langboo is to the N., and the Chour-moo-tsangla chain to the S.E. of Chashe-lo-umboo. The Kentaisse range to the W. is important. One very prominent peak in Ari (the Tese or Kailassa in Sanscrit), celebrated also in Hindoo mythology, and near which are the sources of the most celebrated rivers, lies in the 80° E. long., and 34° N. lat.

The numerous lakes of this country, following in regular succession, next claim attention. They are all carefully enumerated in Chinese descriptions. The water in some is very brackish, whilst that of others contains a crust of sal ammoniac and borax. Some are mere marshes, whilst others are of considerable depth, and one among them belongs to the most extensive in Asia. To the N. of the Tenkiri we have no less than nine lakes. The largest of these is the Kookooma-Dsake. The Tsanpoo is a considerable river losing itself in the steppes. The Tsita and Hara are united by a river which flows in a third lake, through which it empties itself by means of the Pouka lake into the Tenkiri. This lake is a large sheet of water, bordered on the N. by snowy mountains, and receiving from the S.E. the Tā-ne-koo, or Tarkit-Tsangbo. This lake is nearly 1° in length, encompassed during summer by fine meadows, constituting the very elysium of the wandering Mongols. Another river, taking its name from the lake Siran-lo-sa, empties itself into the Tenkiri. Close to the northern frontier three smaller lakes are formed, connected by rivers with those already mentioned. A great portion of the land around consists of pastures, and forms a contrast to the steppes more to the N. To the W. are six other lakes, lying in groups of three each, more or less connected by rivers with the Dsangbo. In the S.W. the Tarpoo, Mapama, and Lanken occur, the latter

communicating with the Larchoo river. These lakes are all situated in extensive fertile valleys, richly watered, and protected from the northern blasts by mountain-ridges. The banks swarm with droves of cattle, and all is life and animation during summer.

The Yarou-Dsangbo (the clear river of the West) is one of the largest in Asia, traversing Tibet, and running through 14° of long. Its source is near the Mapama lake, where other great rivers of Asia take their rise, in about 30° N. lat. and the 77° E. long., on the frontiers of Ari, at the Tsamtserg mountain. This is not far from a lofty peak, named by the Hindoos, Oneuta, and considered by them to be the highest in the world. It stands in connection with four other mountains, which take the names of Horse, Elephant, Lion, and Peacock, and extend 48 geographical miles to the high chain of Ari. The Thungla chain runs from this southward to Nepaul. The Dsangbo here receives many tributaries from the N. (such as the Esunshia, Somia, Archoo, and the Navuk-Dsangbo). Several others join it from the S., running down from the Himalaya mountains, and swelling its course through a fertile broad valley. It passes close to the N. of Chashe-lo-umboo, divided in many branches, forming a number of islands. Over one of these there is an extraordinary iron bridge with 13 arches, 300 feet in breadth, worthy of admiration to all travellers. The Dsangbo then flows nearly E., receiving five tributaries from the N. and five from the S. It forms in the 29° lat. a water-ring, Yamoruk, called by the Chinese Yamuhloo-kih sea, or Yarbok Yumtso. The stream is compressed between two high mountains on the N. and S., and is thus compelled to wind its way in a circle, having its outlet to the W. The island thus formed is celebrated for its monastic establishments, which are visited by masses of pilgrims from all parts.

In Western Tibet few towns are found on the banks of the Dsangbo, but henceforth their number increases considerably. Of tributaries are enumerated the following—the Dsangki-Tsangbo, a very large river which takes its rise on the hills of the northern frontier, and traverses more than half the breadth of Tibet; the Neendsoo, and the Dangdsoo, which join it near Chashe-lo-umboo. The capital, Lhassa, is not far from the northern bank of the river, and is connected with it by the Yang-pantsing. This river is formed by three different branches near the capital, the largest of which, the rapid Tama Dsangbo, takes its rise in the latitude of the Tenkiri lake. The Dsangbo hence assumes a south-easterly course, the fertility along its banks increases, and many cities are scattered in various directions. In spring and summer it is very rapid, and often

overflows its banks. After having taken up the Tsā-bo-dsangbo, a considerable tributary from the N., and the Te-mok, the Dsangbo runs S. into the country of the H'lokba, between snow-clad mountains, the debateable ground of the Birmans. In tracing the course of this river thus far, Chinese authorities have solely been followed. So large a river, subject to such sudden changes, occasioned by the volumes of water pouring rapidly from the mountains and filling its channel, no doubt exhibits the most extraordinary features of shifting sands and varying channels, with all the accompaniments of rapids, rocks, and whirlpools. The banks are much diversified by the grandest scenery, and no river in the world has perhaps to force its way against so many powerful obstacles. The Chinese consider it as the great feeder of the Irawaddy, and that a voyage from Lahdak to Rangoon by means of the Dsangbo may possibly some day be performed.

The Bodsangbo is a river, which, for a short distance, runs parallel with the Dsangbo, and likewise flows into the H'lokba country. It rises in about 30° lat. on the frontiers of Kam and Wei, near one of the lakes, where it bears the name of Langtsoo, and flows nearly S. through a fertile country, well inhabited, to the W. of the celebrated temple, Lari, and finally, at about 10 geographical miles E. of the Dsangbo, enters the H'lokba country. It is not improbable that it flows into the Dsangbo.

The Noo-Keang (or the Om-tsu) rises not far from the frontiers of Kokonor, in the neighbourhood of the lakes, and is formed by five different streams, which unite in about the 27° 50' N. lat. The country is here richly watered and well inhabited. The river bears the name of the Karaocsoo until it receives the Goketsoo, when it is called the Noo-Keang, from the country. It then flows into Yunnan, and receives the name of Loo-keang. It is a large rapid river, and is the most eastern stream in the Wei province. Between it and the Bodsangbo is the Chokdoshaktsoo, a small river formed by the confluence of several others, and, running into the H'lokba territory, empties itself, no doubt, into the Dsangbo.

Amongst the south-westerly rivers we already know the Naetsoo as one of the frontier streams, flowing S.E. The Pangtsoo, more to the E., and the Newtsoo, more to the W., perform the same office in regard to the Bhootan and *Nepaul* frontier, and are no doubt tributaries of the Brah-mapootra, though it is impossible to trace their course in detail. They are rivers of inferior size, and by no means rank with those above mentioned, though the Naetsoo has very large tributaries, and is often very rapid.

The most remarkable river of Western Tibet is the Ganga. The northern branch rises on the Kentaisse mountains, and takes

a westerly course through Lahdak for about 80 geographical miles under the name of Latsoo, receiving many small tributaries from the N. Arriving at the Hindoo-cush, where insurmountable mountains oppose its course, it turns S., and then unites with the southern branch, which takes its rise from the Langkok (Langka) lake, in about 30° lat., and runs parallel with the former, above a degree of lat. distant, known under the name of Langtsoo. After the union, the river runs S.W., and, meeting again with high mountains, retraces its course in many windings, until nearly reaching the parallel of its origin. Receiving here the Matsoo as a tributary from the N., it forces its way towards India, and constitutes, perhaps, the chief branch of the Indus. There is no river on the globe which has three parallel turnings like the Ganga. If we refer to the result of researches made only recently, by which the sources of the Indus are said to be on the northern declivity of the branch of the Himalaya mountains, in lat. $31^{\circ} 20'$, long $80^{\circ} 30' E.$, and assume this to be the same river that passes Draus in Lahdak, we find some difficulty in reconciling this account with the Chinese maps. The Sutlej is said to issue from the lake Rawansrad, in lat. $31^{\circ} 46'$, long. $80^{\circ} 43'$, which would apply to the Langtsoo. The sources of the Matsoo are less known. The above would make three rivers of a stream which the Chinese represent as one. At any rate, very little is yet known with certainty concerning the Ganga.

The temperature is more severe in Tibet, on account of the elevation and rarefied air of the country, than in the same parallel of China. There is something piercing in the cold, which penetrates to the very bone and marrow, whilst the heat in the plains during summer is almost as intolerable. The people, to screen themselves from the severity of the N. winds, are obliged to take refuge in caverns. In many parts, even the Mongols, a nation inured to all kinds of hardship, cannot exist in the depth of winter. Throughout all the neighbouring countries, Tibet has the name of the land of snow and ice, which must, however, not be generally applied, for in situations in the lower lands, well sheltered by mountains, there is often the most luxuriant vegetation and mild climate. The trees bud near L'hassa in April, whilst in other spots, even during the middle of the summer, scarcely a shrub sprouts. The atmosphere from March to May is very variable, and the approach of summer is heralded by terrific thunderstorms. From June to September rains become frequent; the winds, however, are variable, and there is no monsoon. The melting snows from the highest glaciers then fill the rivers, and make them very rapid. From October to March the sky is clear, the atmosphere is arid, and the vegetation is frequently scorched by dry winds. The cold sets in very early, under a clear sky,

and is most piercing; only natives can endure its severity, and many of them fall annually sacrifices to its intenseness.

The traveller on first entering Tibet perceives around him one vast scene of barrenness, and doubts whether, amidst hills of so rocky and forbidding an aspect, any animals can exist. Still we find in Tibet a variety of quadrupeds. The Tibetan horse is a spirited animal, and large droves of sheep graze on the sides of the hills, and furnish remarkably good wool. As mutton is a principal article of food, the sheep are reared with care, and their skins not only constitute the apparel of the lower classes, but are likewise sent to China as an article of trade. The lamb-skins of Tibet are celebrated for their fineness, and the softest are obtained by killing the dam before parturition. Amongst these, the black and glossy skins fetch a high price. An animal peculiar to this country is the shawl-goat, with straight horns, its colour varying from white to grey and black. The precious wool obtained from it is next to the skin, and constitutes a most important article of trade. Many unsuccessful attempts have been made to transfer this breed to other countries. Peculiar to the mountains in the bleakest parts is the yak, or bushy-tailed bull, furnishing the splendid tails so universally in use in Hindostan as chowries. Sheep as well as yaks are here universally used as beasts of burden. The cow gives much milk, and is an invaluable treasure to the nomades of those regions. Tibet abounds in animals of the most varied description. This is the home of the hardy musk-deer, with its tusks and delicate limbs. The bhoral, or ovis ammon, partakes of the nature of the deer and sheep, and is likewise remarkable for its fine fur. There is a variety of dogs, large, powerful, and ferocious, and not unlike our mastiffs. Wild horses, asses, and bullocks, are found in many places in large droves. There are many wild fowls of peculiar plumage near the lakes and on the great rivers, but the natives are not fond of either rearing ducks or geese. The pig is not frequently met with; and, excepting the sheep, there are few domestic animals which claim the care of a Tibetan. The silkworm is said to be reared in a few spots.

But few vegetables are found. Barley is the universal food for man. The country produces little wheat, and this of an inferior quality; but it has a variety of pulse. The pih-tsae, or white cabbage, is very generally found, as in the N. of China. Radishes and turnips likewise grow, but the potato has not been introduced. The peasantry are often driven to fearful straits in mountain-life. Economy being the order of the day, a Tibetan is satisfied with a very little coarse food, and his only indulgence is a liquor distilled from barley. Fruit and wood are very scarce.

The poverty of the vegetable kingdom is richly compensated by the mineral treasures spread throughout the soil. Tibet pos-

sesses a great quantity of gold. It is found in dust in rivers, attached to stones, in lumps, and in irregular veins. The most productive mines are to the W. of L'hassa near Lunchee, at Tardsong, and Lethang. Government permits companies, engaging to pay in advance 400 lbs. of pure bullion, to open mines. There are, however, many restrictions upon mining, which prove, by the frequency of the process, that it must yield much to the contractors. When one considers the large exportation of the precious metal to China and other places, and the amount used annually in the gilding of idols and the manufacture of idolatrous trinkets, the produce must necessarily be very large. At Lethang is a silver, at Rywulse an iron mine, and at Bathang mercury and native cinnabar are found. In many spots there exists rock-salt; in Lhorungdsong and Giamalbo the lapis lazuli, so highly prized in China, is met with, and in Draya the turquoise. All travellers who have visited the country speak of its great metallic riches. The great drawbacks upon mining operations are the scarcity of fuel and the rigorous climate.

The northern parts of Tibet exhibit scarcely any vegetation; towards the E. the country improves somewhat. Those who enter the country from the luxuriant regions of Hindostan feel the change very strongly; whilst the Mongol, who, as a pilgrim, has crossed the desert, looks upon Tibet as a paradise.

Tibet, called by the Chinese Se-tsang, by the natives Bodjul (from Pod or Bod), and by the Mongols Barantola, or the country to the right, was in ancient times better known under the name of Tangout. It is divided into Tseen-tsang, *anterior* Tibet, or Wei; How-tsang, *ulterior* Tibet; Lahdak or Ari, and Baltistan.

Baltistan, or Beltijul, is also called Little Tibet, and is imperfectly known to Chinese geographers, and in general to the civilized world. The country is situated to the N. of Cashmere, E. of Badakshan, W. of Lahdak, and S. of Yarkand, extending from 34° to 36° lat., to 74° to 78° long. E. It is more fertile than the greater part of Tibet, and in the low grounds the inhabitants have annually two crops. The rivers which cross it are said to contain gold-dust. The inhabitants speak a dialect of the Tibetan language, but are for a great part Mohammedans by profession, belonging to the Shea sect. In their ideas they are very tolerant, and do not molest the pagans who live amongst them. They stand under the government of several petty chiefs, such as Shigoo, Iskardo, Minaro, &c., who are often at war with each other. Several tribes in the country live by plunder, thus rendering the caravan trade, which in olden times was in a flourishing state, now a matter of difficulty. Want of salt forces the inhabitants to have some intercourse with the rest of Tibet; and as the shawl-goat does not thrive here, their woollens for winter are also imported from Tibet. Though apparently of the same origin as

their eastern neighbours, the Baltistan character is totally different, for it partakes of the courage of the Afghans and the disposition of the Persians. Baltistan may be considered as a link in the great chain between Budhuism and Mohammedanism. Wherever these two creeds meet, the professors of the former prove themselves inferior, and the Chinese rulers can only with great difficulty maintain a hold over the latter. The educated natives understand the Persian, and the authorities correspond in that language with the western chiefs. Some attempts have been made to open a trade to Yarkand in teas and silks, but the poverty of the people prevents them entering upon large speculations. The Cashmerians have at various times encroached upon the country, and Akhbar is said once to have held the nominal sway. The great indigence of the Rajah, who came as a suppliant to the Mongol camp, prevented this great prince from taking actual possession of Baltistan.

Respecting *Lahdak*, Chinese information is more correct, but still unsatisfactory. The Tibetans distinguish six chains of mountains that traverse their country in a south-eastern and north-western direction; the highest of these, the Kentaisse (so well known under the Sanscrit name of Kailassa), is in Lahdak. Lahdak is the land of fountains and rivers, highly elevated above the sea, under a rigorous climate, and very unlike Hindostan. It borders towards the N. on the Karakorum (Tsungling) mountains and Chinese Turkestan, under the jurisdiction of Yarkand; N.W. on Baltistan; S. on Bussaher, Cooloo, Chando, and on the Seikh territory. Eastward it borders on Chinese Turkestan and the Tibetan province of Chuntang; and W. on Cashmere.

The Mapan (the Manasarowa) is about 14,000 feet* above the level of the sea, and is surrounded by frightful mountains. It is a considerable lake, situated in the grandest and most romantic situation, almost constantly kept in motion by gusts of wind that sweep through the mountain-passes. The shores are adorned in the most conspicuous spots with nunneries and convents. From Hindostan numerous pilgrims attempt to reach the spot, under the belief that the sources of the Ganges are here to be found; very few, however, accomplish their design, for hunger and cold sweep them away long before they have beheld the wonderful lake. The Langka (Rawan-rhad), N.W. of this, is a much larger sheet of water, which receives in its bosom many mountain streams. A large marsh extends through one of its valleys, and it has a very considerable outlet. Near it is the magnificent Gangdisri, the highest peak of the Kailassa.

* According to Lieut. L. Strachey the Cho-Mápán (Manasarowar) is 15,250 feet, and the Cho-Lagan (Rákas Tái) the same.—En.

Fossil skeletons of large animals, in a state of preservation, like those in Siberia, bestrew the banks.

The sources of the Indus are farther W. of the Langka lake, which in the Chinese map is joined to the Mapan by an intervening stream. There are no less than five streams which have the claim of giving rise to this celebrated river; one proceeds from the lake itself, and two others stand in connexion with its tank-like waters. The northern branch is called Satadra (Satahadra). The Kentaisse mountains pour down rapids both into the lakes and into the infant stream, and the superstitious veneration of the Hindoos may find some excuse in the grandeur of the scenery. The valley through which the river flows is very extensive, and forms the most fertile part of Lahdak. We find a small town on a high plateau, overhung by rocks of the most fanciful shape. Here also are hot springs, and the chalk mountains are adorned with niches and small temples, whilst there is close to the city a very large monastery. Only 22 miles from the Langka lake is Keenlung. All along the road are hot springs, and near the city is a fountain strongly impregnated with sulphur, and from a cavern sulphurous vapours arise through the calcareous crevices. This small town presents in itself a very grotesque appearance, from the manner in which it has been constructed. The inhabitants, to screen themselves from the rigour of the winter, have separate habitations, so well sheltered from the wind as to rescue them from the immediate consequences of the piercing cold. The nature of the soil remains the same until we reach Dampo, in lat. $31^{\circ}6'$, long. $80^{\circ}15'$. The fertility increases on arriving at Deba further to the S. in long. $80^{\circ}5'$. Corn grows here not only in sufficient quantity for the consumption of the natives, but likewise for exportation. The temples in the neighbourhood are numerous and beautiful, but the friars themselves are filthy, ignorant, and domineering.

The country to the W. of the Langka, between the Kailassa and Himalaya range to the N. of Bhootan, with which it is connected by the Niti-Ghaut, a pass 15,778 feet above the level of the sea, is called by our geographers Undes, and borders to the N.W. on Lahdak. It was formerly subject to a Rajpoot race, who styled themselves Surgabans, or Children of the Sun. Frequently harassed by their neighbours, they were forced to implore the easily-obtained protection of the Chinese. The country has been subsequently incorporated with the territory of the Dalai-Lama, and the natives of Lahdak have been restrained from their incursions by Chinese policy. The Sutlej is the second branch of the river near Deba, where it is 80 yards broad, but only $3\frac{1}{2}$ feet deep. Large flowery shrubs, resembling the tamarisk, are found in its bed, which shows that the river cannot be very rapid

at this spot. The soil is much broken by the climate, but contains gold. There are scarcely any trees, and the sufferings of the natives from want of fuel are very severe. A species of hare is found here in great numbers, and the celebrated shawl-goat constitutes a real treasure to this otherwise desolate country. With the exception of the spot around Deba, little vegetable food for man is produced, and the natives have to import grain from the S. through the mountain passes from Bussaber. The inhabitants, known under the name of Uniyas, who live through the summer as nomades under tents, are subject to a lama residing at Toling, in lat. $31^{\circ} 19' N.$, long. $79^{\circ} 48'$. He maintains despotic sway over his subjects, and carries out his regulations by spiritual weapons. Notwithstanding the poverty of the land, there are riches in the monasteries which surprise every visitor. In them are the treasures of literature, of learning, and even the scanty produce of the country hoarded up. Of the gold obtained by them with immense trouble, they send a share to the temples, and the collected riches of generations may here be seen. It is therefore not a subject of wonder that the Ghorkas, on one of their inroads, were able to carry away from the monasteries a large quantity of grain (about 12,000 pecculs of rice) and other articles. Suffice it to say, that whilst the laymen starve the priests feast.

Proceeding about 20 geographical miles further to the N.W., we arrive at Shipke, in lat. $31^{\circ} 49'$, long. $78^{\circ} 44' E.$, on the banks of the Satadra, and the first place after crossing Kanawar over high passes exceeding 5000 feet on the frontiers of Hindostan. The Satadra forces its way through a narrow defile with fearful noise, turns then S. and S.W., and forms many beautiful cascades. From this place it receives the name of Suttlej, as it winds its way to Hindostan. At Shipke it is 100 feet broad, 6 feet deep, and very rapid. Many mountains raise here in every direction their snow-clad heads, and invite the traveller to admire the natural grandeur of the scene. Shipke itself is a very insignificant place, but constitutes a great thoroughfare between Central and Southern Asia. Many merchants make it a temporary abode, and considerable quantities of goods are here stored up. There is, however, very great reluctance shown in permitting an intercourse with Hindostan, and the traders, who introduce the shawl-wool by this way, are subjected to much extortion, in order that the whole commerce may be forced to Cashmere, the legal route. Yet it is very evident that the cessation of this trade would entail the greatest hardships upon the natives, by depriving them of cheap food, which they receive by this channel. This fear weighs up against all political considerations, and the provisions of India, brought by way of Shipke, meet with a ready and rapid sale, notwithstanding Chinese jealousy. The southern

bank of the Satadra exhibits a variety of valleys with a number of rivers, all tributaries of the Indus, such as the Baspa, the Tag-lachar, the Hocho, and Tidung.

The most southern branch of the threefold river bears the name of Spiti (Peich in Chinese); that which flows down from the N. is called Le. The population, of the same race as the Tibetans, acknowledge allegiance neither to the Lahdak Rajah nor to that of L'hassa. The rule of the latter commences on the northern banks of the Spiti, along which are many well-garrisoned fortifications. We find here the Chemonsed lake, the most southern of the whole number, surrounded by very high mountains, and appearing like a great basin. The Spiti itself is shallow, nearly as broad, but not so rapid as the Sutlej, which it meets at a place called Dabling.

Europeans have penetrated to the country by the Hangerang pass, repaired to the neighbourhood of the Shalkar fortress, reached Tenge through the Munerang defile, and also arrived at the celebrated Gortorpe in lat. 31° , long. $80^{\circ} 23' E.$, situated on a tributary of the Latsoo in a valley about ten days' journey from Lahdak. This is a place of considerable trade, a mart for the northern tribes, where they can exchange their wool and other articles for the productions of Tibet.

The regions N.E. of the Latsoo have never yet been visited by foreigners, and the territory E. of Langka consists of nothing but towering mountains. Right in the midst of these is the Kungchoopiti lake, and to the N. the Sangkar-kan-poo peaks, which rise far above the mountains on the frontiers of Hindostan.

This part, as well as that more to the N.E., is known under the name of *Ari* or *Lahdak*. The inhabitants, divided into many tribes, are nomades, acknowledging the supremacy of the Grand Lama, so that the distinguishing appellations of Kangre, Gugé, and Purang have disappeared. Various forts are erected in the country, and the Kharpons and commandants rule over them with full authority. Their chief resides at a place called Garo. The stupendous height, the piercing cold, the sudden changes of weather, fearful hurricanes, and dangerous passes surround the tourist through these inhospitable regions with innumerable perils.

The chief town of this district, a collection of 700 stone houses, is Leh (or Lahdak). It is situated in a valley, and is well sheltered against sweeping blasts. This town, being the grand emporium between Turkestan, Tibet, and Hindostan, has a lively trade; and provisions, though mostly brought from a great distance, are cheap. There are merchants from various quarters of the earth living here, and all religions are tolerated. As many of the inhabitants are Mohammedans of the Shea sect, there is also a mosque built, to which worshippers may repair at pleasure.

The whole number of inhabitants belonging to the jurisdiction of the Rajah is variously estimated at 20,000 to 60,000 families. Those in the W. are converted to Islamism, but have very confused religious notions; whilst the eastern inhabitants are devout votaries of Lamaism. The natives do not bear a high character for probity, are deceitful in their dealings, and filthy in their habits. Like the Chinese, when greatly irritated by an antagonist, they injure their own bodies in order to bring their adversary into trouble, and even commit suicide that he may be executed for murder. *Polyandry* is common, and many brothers have only one wife, the children belonging to the oldest of the brothers. Chastity is neither honoured nor sought. The poorer classes dress in sheepskins throughout the year, have their hair plaited in two tails, and the women wear precious stones and other ornaments in it. Rich people cover themselves with costly furs. The natives are frugal in their diet; their most favourite dish is roasted barley, boiled down with mutton to a jelly; wealthier people only indulge in *rice*. The houses are built of granite, wood being too costly. The inhabitants suffer much from rheumatism. Their beds are made of sheepskins heaped upon each other; their utensils are few and clumsy; and their whole mode of life is very dreary, especially during winter, when every aperture of their close habitations must be shut up. They use a quantity of coarse black tea, and eat the leaves mixed up with milk and other substances; this tea has become a necessary of life, and the Chinese government can easily punish them by cutting off their supplies.

The inhabitants have a great inclination for a monastic life, and there are few families that do not send a son or a daughter to the convent. One of the reasons assigned is to keep down by this means the population. They are moreover most fervently attached to Buddhism, and place their greatest happiness in a contemplative life. The Lamas can do with the laymen whatever they like, and the highest authorities in the land bow before their decree.

The trade through Leh has always been considerable. There are three fairs held annually, at which merchants from Eastern Tibet, Turkestan, Bokhara, Cashmere, and the Punjaub assemble. The exports are shawl-wool (a monopoly of the Rajah, who imports it from the Undes to the amount of several lacs of rupees), common wool, and gold. The Yarkand merchants bring to the market silver, carpets, Chinese silks, and other manufactures, furs, and earthenware. From India the imports consist of cotton goods, chintzes, muslins, spices, fruits, and a great variety of provisions. The greater part is re-exported to Eastern Tibet. An extensive trade is carried on with Cashmere in shawl-wool. The new relations of Great Britain with Cashmere and Tibet may mate-

rially increase this commerce, which, even under the Seikh administration, yielded annually 2½ lacs of revenue. Now and then Russian subjects make their appearance at these fairs with leather, woollens, glassware, and trinkets.

The foreign intercourse of this country has naturally been very much circumscribed. Shah Jehangir, in 1640, formed the plan of conquering Tibet. The advance to Leh showed the adventurers the futility of such an enterprise, and the Mongol general had to retrace his steps.

The connexion with Eastern Tibet is of old standing. There resides the great chief of Lamaism, to whom the Rajah pays the most devoted reverence, and sends regular tribute. His subjects hold the most friendly intercourse with the natives of Udsang. The nominal subjection to Chinese rule has its origin in the submission of Labdak to the Dalai-Lama. National exclusion is strictly enforced by the former power; and the whole frontier is lined with guards, who oppose the progress of a foreigner. The herdsmen on the brows of the hills must instantly give notice of a foreign arrival; and before a weary traveller can penetrate a few miles into the interior, hundreds of horsemen announce his approach to the authorities.

The government is under a Rajah, and administered by a Kalun or Vizier, a Minister of Finance, and a Generalissimo. Whenever a son is born to the Rajah a regency is instantly instituted under the Kalun, and the Rajah ceases to have any material influence in government. In private families also the law directs, that whenever a first-born son is grown up, the father shall cede to him all rights. This is, indeed, carrying the privilege of primogeniture to an extent as yet unknown in other countries.

Howtsang, or Udsang, is that part of Tibet which comprises six cantons to the N. of Nepaul, to the S. of the Great Desert and Kokonor; to the W. of Tscën-tsang, and to the E. of Ari or Labdak, and contains the cities Dingghie, T'ounghea, Nielam, Dsilaung, Deounggar, and Chashe-lo-umboo, the capital, with the Banchen Erdeni for its sovereign. The country is traversed in its whole breadth by the Dsangbo (Sanpoo) river. The southern parts are known to enterprising travellers: the northern have never yet been visited by Europeans. Its northern boundaries extend beyond 36° N. lat. Its utmost western limit is 36° W. long. Peking, and its eastern 26° W. Peking. It forms, therefore, nearly a square. Chinese maps carefully delineate its frontiers.

The N. W. is a complete desert, remarkable for its high sand-hills and lakes. The largest of these, the Pahan, in lat. 34°, about 70 geographical miles in circumference, is of considerable depth, with fertile meadows all around. It is joined to another

lake, the Ekir, by a stream of 65 geographical miles in length, and may be considered as the largest sheet of water in this country next to the Tenkiri. Immediately to the N. and S. ranges of mountains extend beyond the reach of eye; but the lake itself is situated in a large magnificent valley, well sheltered against the northern blasts.

To the E. of the Yating and Chari mountains, between $31^{\circ} 40'$ and $32^{\circ} 50'$ lat., lie the Lank-poo, the Chapee-dsake-tson-psoo, and the Tarook-yomdssoo lakes. The latter has two streams flowing out of it, one of which runs a considerable distance S. The plain in which these waters are found is more than 3° of lat. in length, and 20 geographical miles in breadth, being richly watered by sundry streams. It is a very favourite haunt of the Mongol nomades, who frequently proceed to L'hassa to render homage to the Pontiff; yet there is no settled population. Farther E., in a second but narrow valley, and about $33^{\circ} 32'$ lat., the Raron-hokon and Kirsak lakes are situated. The latter is remarkable for its giving rise to a considerable tributary of the Dsangbo.

The next valley is much larger, and is traversed by a beautiful stream, which, uniting with another issuing from the lake Rarong-chakon, form the Sanke tributary of the Dsangbo. At the head of this valley, bordered by the Dsatin, Poolong-chung-tung, and Machoo mountains, is the Leo lake.

Between the Pahan and Ekir lakes there are no less than six smaller ones to the S. of the stream by which both are joined, and nine to the North, so that the whole district during heavy rains presents one sheet of water for more than 80 geographical miles. The water is, however, brackish; and the environs have nothing of the smiling aspect of the S. The shores are therefore little visited, and the same stillness prevails as in the north-western parts. The Ekir is next in extent to the Pahan, and is very rich in the finny tribe.

Farther E., nearly in the same latitude, is one of the rivers which, after traversing some 40 geographical miles of steppes on the confines of the desert, loses itself in the sand. The Tunkin-yomso, the Tunkong, the Anedsai, the Taksai-rake, and the Siranlo-sa lakes, follow each other successively in a north-eastern direction towards the great Tenkiri. The three latter are surrounded by high mountains, which form a kind of amphitheatre, and give to the whole a very grand appearance. Immediately S. of them the Tar-kondsampo runs through a broad valley, after having communicated, by means of the first, with the Tenkiri. This is one of the fertile and more genial spots so much sought after by the Dam Mongols. It is sheltered on three sides, the pastures on the banks of the river being extremely rich, and extending over a considerable ground near the great lake,

The lakes in the S. are so small as scarcely to deserve notice. The Dsangbo is the great river, broad, deep, rapid, and destructive, holding its majestic course through the central part of the country, and comprising in its valley all the civilization of the Banchin-Erdeni. The principal source lies to the S.E. of the Mapama, in lat. $29^{\circ} 10'$, at the foot of the Lancheakepoo peak. Three different rivulets unite into one stream, and are joined at some distance thence by another. This is the mighty Yarou-Dsangbo in its infancy. Directly E. of the Mapama another branch arises, which is frequently confounded with the former; and having united with the Keang Rea-Somea, one of the streams from the northern mountains, mingles its waters with the parent.

A few miles eastward, two others, the Archoo and Naoop, likewise swell the volume of water from the N. Farther E. is a spacious valley, the largest in Udsang, containing a network of streams which flow into the Dsangbo.

The inhabitants in this part, so unlike their western neighbours, lead a life of comparative ease in their tents, made from the hair of their favourite yak.

Beyond these rivers the country assumes a more dreary aspect, and a considerable sand-plain extends to the E. of the Kentaisse mountains and N. of the Konghe lake. Through it flow the Tarpoo, Rachin-sopa, and the Nakoi, brackish steppe rivers. The last stream joins the Darook-yom-dsoo at the Nakoi lake. Another valley more to the N. has a circular appearance, being surrounded by the Chooroo Ponoroo mountains to the S., and some hills to the N., with the Cham-dsoo teyak lake in the centre.

Turning S. we find, within 20 miles, four distinct feeders, flowing in a north-easterly direction from the Himalaya mountains, to join it. The first is by far the most important, as it receives several tributaries, and occupies a considerable valley, similar to that on the northern banks.

Farther E. the valley of the Dsangbo is nowhere very broad; chains of mountains approach from the N. and S. The Sunke rises in the N., and, running 50 geographical miles, unites with the Dsangbo. Some other smaller rivers flowing S. subsequently join it. At the most western of these, between two lakes, lies the first city, Changprang; next follows the Oochoo river; then a smaller one follows; and on the banks of the third is situated Chamnamring. The most eastern town on the northern banks of the Dsangbo, not far from the frontiers of Khamjul, is Chrosor.

The rivers which come from the S. are of far less importance. Between them and the lake at the foot of a mountain is the town Aridson. To the E. is an immense chain of snow-capped peaks, between which flows the Monker tributary, with the city Changlase. Immediately on the banks of the Dsangbo lie the towns of

Keltan-poosook and Likle. The Mandroo, another tributary, has two other towns farther S., viz., Puenum and Chiantse, on its banks. Following farther the course of the Dsangbo at Palte, we reach the wonderful circle encompassing the island, on which superstition and bigotry have erected such magnificent temples. On the south-western part is the city Kwei-uklinke.

On the northern side of the Dsangbo almost all the rivers are tributary to it, and few only flow into the lakes. To the S., on the contrary, many run through frightful chasms into Nepaul. One of the principal ones to the W. is the Necho, which for a considerable distance constitutes the boundary between the two countries. Chiron is not far from its northern banks, and Nialma on its southern, is the last place under the dominion of the Banchin-Erdeni. The Necho, after having wound its way round the Dsarampoo and Choo moo Lankma mountains, flows into the Neleo, which has already received the Paree, and on which Pareedsong, a large city, is situated. The Necho winds its way towards Bhootan, with Toodsong upon its banks.

The above shows that Udsang is a land of lakes and rivers, richly irrigated, frequently exposed to inundation from the fury of its streams, and uncultivated, excepting on the southern banks of the Dsangbo. No less than eight chains of mountains run North from the river. Those to the S. are much higher, and appear in all their grandeur on the Nepaul frontiers. The valleys that lie between them are remarkable for their fertility.

Ari, to which allusion has been already made, is subdivided into—1, Boorang, the southern part; 2, Sankar, the great plateau; 3, Tamo, the north-easterly part; and 4, Jongar, the northerly desert regions. The cities Dingghie Toongea, Ngialam, Dsiloong, and Tsoongar, are the capitals of as many districts in southern Udsang. The fortress, Dsegadzejeung, is built in the centre of the country, whence roads diverge to L'hassa, Bhootan, and Lahdak. The population of both sides of the river may be estimated at about 200,000 families, only few of whom live in cities.

Chashe-lo-um-boo, not far from L'hassa, and the residence of the lord of the land, in lat. $29^{\circ} 7'$ and long. $80^{\circ} 2'$, is a collection of convents, containing about 400 buildings. It is situated in a considerable plain, surrounded by high, sterile mountains, with the Dsangbo on the N. side in view. Above 4,000 friars and nuns perform daily their devotions. The Banchin-Erdeni holds here his court in great state, and his orders are as binding as those of any despot in the world. A large manufacture of idols is established, at which the most skilful workmen are employed, but there are few laymen, except the servants of the Lama. A Chinese functionary resides here to watch the proceedings of the

priests. Some hundred mendicants from India and Nepaul are also maintained by the Lama at the public expense.

Keenlung, the Chinese Emperor, desired a late Banchin-Erdeni to come to Peking, in order to instruct him in the mysteries of Shamanism, but in reality to grace the latter years of his reign with the presence of such a high personage at the capital. A tedious journey with an immense train and the highest tokens of reverence and veneration all along the road, brought the high priest to Peking. He was there received with great honours, the Emperor became his pupil, and the Banchin-Erdeni finally died of small-pox.

TSEËN-TSANG, OR ANTERIOR TIBET.

Tibet Proper is generally subdivided into Wei, the western; and Ram, the eastern part; the latter bordering upon Sefan. The former constitutes eight districts or cantons, viz. to the E. L'hassa; Chamda, Shobundo, Podzoong, Shari, Keangta; and to the W. Chas and Keangin. In Khamjul (or Poebën) we find Khambo, Gaba, Le-thung, Derghe Brag-yak, Depma, Gojo, Gyamorang, Jungsutam, Amdo, and Kheamdo. To the N. the Dam Mongols reign supreme; to the E. many tribes acknowledge the supremacy of China, and not that of the Dalai-Lama.

Tseën-tsang borders to the N. on the Shamo and Kokonor; S. on Assam, Birmah, and the territory of the wild tribes; E. on Sefan and Kokonor; and W. on Udsang. It extends from $26^{\circ} 20'$ to 32° lat., and from $17^{\circ} 15'$ to 28° West of Peking.

The north-eastern part is desert. In the latitude of the Ikir lake, six small lakes are found to the N. of the Yarkea, a river of the steppes, and three to the S. They contain all brackish water. The Pooka lake is a large sheet of water, separated by a chain of mountains from the Tenkiri and the Achigo; to the W. are the Siran-loso and others already mentioned; northward are the Tsita and Hara; E. is the Medok; and nearly S. of these, in the centre of the country, the Chamna Yam-doo, and Pasamdso. The Amdso lies in a large valley towards the Birmah frontiers. Near the fountains of the Yellow river, though properly belonging to Kokonor, are the Charing and Oring lakes, and a number of smaller ones, which form in spring one large marsh. The Yarkea, Petvo, Jkeactum, the Kophoo, and other steppe rivers of smaller size become dry in summer.

The valley through which the Dsangbo flows in a south-easterly direction, in many windings, is the largest and most fertile in all its course. Crossing from Chashe-loumboo eastward, we arrive at Choosor on the northern banks. The Kaltew runs into it from L'hassa, which is about 6 geographical miles due N.

from the river. The valley expands here, and we find within a very small space the towns of Samee, Sanire, and Ooketanaksa, with a number of others. To the S. of the Dsangbo, in the same valley, are a number of cities, as Oitung, Choo-kea-pooran, Cheakar, Yerko, Cheko, Takpuilaksoi, Leoikealanktsa, and many others, so that this tract constitutes the best inhabited part of all Tibet. In long. $21^{\circ} 50'$ W. of Peking, it receives its last tributary in Tibet, viz., the Dsapbo, and then forces its way through the towering mountains that separate this country from Birmah. Not far from its southern banks, Toukchong, Takpooina, Chamkaad, and Takpoochae, with other cities, are situated in the smiling meadows, forming a complete contrast to the northern regions of snow and sterility. To the N., on the Dsapbo, we find Choke, Choomoo, Temoo, and Dsaplarkeng, the latter not far from the Dsangbo. The Dsapbo forms with the Bod-dsangbo a fertile valley. This river rises in lat. 32° , near the Metok lake, and receives from the N.E. a number of tributaries, of which the Noicho is the largest. On reaching Choon-tong it unites with another river, and then runs parallel with the majestic Dsangbo, into which it probably flows.

In south-western Tibet the Omdsoo, rising in a chain of mountains to the S. of the Dsangbo, fertilizes a considerable valley. It receives the Lapra-Kachoo in lat. 27° . Between these streams are many considerable cities, such as Lapra Lankeng, Senke, Momdsona, and Tanengdsong at the confluence.

Near L'hassa a number of small rivers form a regular network. They are the Tama and others, the sources of which are at the foot of the mountains to the S. of the Tenkiri lake. This river receives a great many smaller ones from the E. and W., and falls into the Dsangbo under the name of Kaltew. N.E. of L'hassa, Tetse, Keltan, Noroo Konghe, Chamta Onna, Tapataksa, Longhoodsong, Panktoo, and Pereoote, are situated near its banks. The valleys through which it flows in the N. are large, but not well cultivated.

A small rivulet, flowing from the Toopoor lake, constitutes the head of the Sook river, which commences its south-easterly course in $33^{\circ} 30'$ lat. In the 31° lat. it winds its way to the S., through many mountains; Paksong and Tsatsorkeng, the two largest cities in this part of Khamjul, are situated near its banks. In the $27^{\circ} 10'$ it runs 10 geographical miles E.; and under the name of the Noo enters the wild country of that name. This is the largest stream of Khamjul.

The Dsadsa belongs more properly to Sefan. It rises, however, in Khamjul, in $34^{\circ} 50'$, where it is called Kerkite. Receiving the name of Dsadsa, it runs S.E., passing several cities, of which Soorman appears to be the largest. In about the 30° lat., near

the city of Konkoodso, it receives other tributaries, both from the W. and E., and then runs S., nearly parallel with the Poolugdso, until in the $27^{\circ} 10'$ it enters Yunnan under the name of Lan-tseang.

The Poolugdso rises in Kokonor, and, already become a considerable stream, enters in lat. 33° , Khamjul. It first runs E. by S. half S., and then due E.; but on reaching Sefan it changes its course to S.E. by S., and is remarkable for its serpentine windings through the mountain ridges. Here and there a city is seen near its banks. Reaching in the 27° Yunnan, under the name of Kinsha (Golden Sand), the first town is Lin Keangfoo. The Kinsha is the celebrated Yangtze-Keang, the largest river in Asia, and the second in extent on the globe. It is throughout its course one of the most beautiful streams, free of rocks and other impediments, and is, even in the Kokonor, navigable. No river in the world has on its banks so many large cities and such a dense population as the Yangtze, and none exceeds it in commercial, national, and political importance; whilst its historical data go back many centuries, even beyond the records of the Nile.

In the eastern parts the mountains run N. to S. from the Oring and Charing lakes down to Birmah. In Khamjul the northern parts exhibit the same boldness of mountain scenery as Kokonor. There is, however, one large valley, called the Kookoo Odso, which contains the richest meadows, and is the favourite abode of Kalmuck tribes.

The soil throughout the L'hasa district is fertile, and exhibits in many spots a great deal of productiveness. Grains of various descriptions grow almost spontaneously, and the sites for the cultivation are so well chosen, that no blast can easily destroy the harvest. Even at the foot of the mountains the peach and other fruits thrive luxuriantly, and timber trees reach a considerable height. The inhabitants of the less favoured parts, and, above all, the nomades, look therefore upon L'hasa (the seat of the Dalai-Lama) as a paradise. Along richly-watered tracts grow beautiful flowers; and the early spring in April, produced by the powerful rays of the sun in valleys almost entirely sealed up, develops beauties which the frozen regions of the desert can never possess.

L'hasa, the capital of the country, is situated in an extensive valley, in $29^{\circ} 30'$ lat., $91^{\circ} 6'$ long. E. of Greenwich, S. of a small river. It is surrounded by a stone wall, that also encloses the sacred oval mountain Botala. It is about thirty le* in circumference, with five gates, which receive names from the countries to which they lead; such as Ladackee, Nepalee, &c. Four large

* 3½ le = a geographical mile.—Ed.

monasteries (Bhraeboong, Lera, Ghaldan, and Lamee) are built towards the four quarters of the world. The regent resides in the centre, the four principal civilians in each of the corners of the city. The houses of the people are built of common stone, often three stories high. There is not much art shown in their construction, but the sculpture, in which the natives excel, is often exquisite. The buildings of the nobles (kah) are very large, and can house a hundred individuals, or even more. Outside the great temple, parallel with the enclosure, is the bazaar, which is occupied by petty traders. Strangers, such as Chinese, Nepaulese, and Cashmerians, have here their abode; the wealthier classes of merchants reside beyond it. The streets are broad. All that Tibetan ingenuity or art can produce is shown in the temples.

The Botala hill, so celebrated amongst the votaries of Lamaism as the residence of the Dalai-Lama, has three peaks, and is covered with monasteries and palaces. So many sacred objects are here accumulated, that it surpasses in wealth Mecca and Medina, and is visited by pilgrims from all the steppes of Central Asia, with occasionally a devotee from China. It shares in some measure its fame with Pooto, a Budhuistical establishment near Chusan, once very gaudy and splendid, but now verging towards decay.

The palace of the Dalai-Lama itself is called Porunnaslen (red city), on account of its colour. It lies N.W. of L'hasa, is 367 feet in height, and has above 10,000 apartments, being the largest cloister in the world. Its cupolas are gilded in the best style; the interior swarms with friars, is full of idols and pagodas, and may be looked upon as the greatest stronghold of paganism. The apartments for visitors and devotees are many and spacious, and the urn for making tea, to refresh the weary pilgrim, is constantly boiling. There is, perhaps, no spot on the wide globe where so much gold is accumulated for superstitious purposes. The offerings are enormous; the treasury, unlike that of western nations, increases every year, and Dalai-Lama is said to be the most opulent individual in existence. Although a great quantity of gold is used in the manufacture of idols, in gilding, and in ornaments for superstitious purposes, still the consumption does not equal the increase. A large monastery is especially assigned to the foreign Lamas, who flock thither from all quarters. In the neighbourhood are many beautiful gardens, exhibiting all the distinguishing marks of the Tibetan flora. Nothing exceeds the Dsombheo park, filled with cedars and cypresses, through which the Dsang-tsew flows. This is a rapid rivulet, remarkable for the beautiful stones found in it, and for its bridge of glazed tiles. Here the Dalai-Lama passes the beautiful summer days in deep

meditation. The Bhraebung, situated to the W., contains above 5000 students. Many magicians are attached to this, as well as other monasteries. The Dalai-Lama passes likewise here many days during summer, on account of the magnificent surrounding country. In Samei there is a large printing-press, where the absurdities of Dalaism are perpetuated. The demand for the books is very great, each volume being equivalent to a relic, and hundreds of workmen are constantly employed to supply the wants of the Tibetans, Kalmucks, and Mongols. There is likewise a considerable manufacture of idols, incense, and wax candles, which are exported from Tibet to China, and prove a fertile source of gain to the hierarchy. In the Lera monastery, an areolite, looking like a bar of iron, is carefully preserved, and shown to votaries as an extraordinary wonder. The Dalai-Lama repairs to it once a-year in person, in order to discourse on the doctrines of Shamanism.

The inhabitants are good goldsmiths, excel in the art of sculpture, cut stones to perfection, weave coarse woollen cloth, and make excellent velvet. Many trades, such as tailors and shoemakers, are followed here by females exclusively. Women are often the principal merchants. As the great emporium for silk and tea from China, L'hassa holds the first rank in Tibet. It exports much gold in bars, as well as manufactured; wool, raw and wrought, and incense. The streets are thronged by merchants and pilgrims, the latter bringing often their native produce to the market, in order to defray the expenses of their journey. The stationary inhabitants are not under 50,000, a large portion of whom are priests. There are many cities in the neighbourhood, as well as a large number of monasteries. The Chinese camp is a separate establishment, and comprises most of the dignitaries sent by the Peking court, as well as the soldiers. Many gorgeous buildings, perhaps unique in their kind, adorn L'hassa, and all the temples throughout Tibet are modelled accordingly. Their idols are full of expression, and wherever the grotesque and colossal form is not required by the tenets of their creed, the Tibetans imitate nature very well. They are, moreover, good jewellers. Their woollen manufactures resemble felt more than our cloth, and are in demand in China, and even introduced into India. The velvet made at the capital is celebrated for beauty of colour. In dyeing textures they excel; there is a peculiar gloss and freshness in their tints, some of which are inimitable. Their rosaries are exquisitely made; the stones are taken from the sacred river near L'hassa, and are beautifully cut. Coral, carnelians, &c., imported from India, are most carefully cut, and then again exported.

The most numerous class of strangers resident at the capital

are the Nepaulese, 2000 to 3000 of whom have established themselves there as jewellers and traders. A vakeel, sent by the Katmundoo government, performs also the office of envoy, corresponds with the Chinese authorities, and rules over them. Their rapacity and cunning are proverbial, and, though they are very devout, the Tibetans despise them. Yet they are a thrifty people, and export much silver and tea to Nepaul, as well as Chinese silks, musk, yak-tails, sable-furs, and gold; for these they exchange sugar, sweetmeats, broadcloths, and European manufactures, such as glass, cutlery, &c. The trade, though not extensive, is increasing. The Debraja in Bhootan has monopolised the commerce from his dominions to this country, and his own servants alone can carry on the trade. These come annually in caravans with Indian produce and a few European manufactures. The largest trade is carried on with China, whence a necessary of life, tea, is received. The annual caravan from Peking reaches L'hassa within nine months. Tea is the principal article of import into Tibet; next to it are silks of various descriptions, and a few cottons. The Chinese merchants take in exchange gold, woollens, candles, incense, and idols. The whole commerce is not under 2,000,000 taels in value, and is annually augmenting. The Chinese have splendid establishments at L'hassa, betokening at once their industry and enterprise.

Next to the Nepaulese in importance are the Cashmerians. Their principal articles of exportation are shawl-wool, silver, gold, and tea; in return for which they supply L'hassa with various kinds of dried fruit, provisions, shawls, and certain descriptions of woollens. This commerce has of late been much increased. The merchants live under the protection of the Dalai-Lama quite safe, without being subject to heavy extortions, and realize considerable profits.

The Mongols have many establishments at the capital, mostly of a religious nature. They, however, provide the city with skins, wool, and live stock, taking in return idols, rosaries, and teas. The commerce with the Calmucks is of a similar nature, but on a more extensive scale. Caravans come also from Sefan, Kokonor, and Turkestan, the latter being the country through which Russian goods are conveyed. They have each their resident merchants, so that the capital is thrown in high bustle during the summer months, and much business is transacted within a short time.

The art of writing was introduced into Tibet in the seventh century. The Chinese at an early period mention the Tibetans under the name of Kheang. They were wild and brave, and gave the Chinese generals much trouble.

One of their chiefs, hearing of the spread of Budhuism, despatched his principal adviser to India, in order to make himself

acquainted with its tenets. On his return he persuaded his sovereign to embrace this religion, and to build a large temple at L'hassa. The sacred books imported from Hindostan were translated into the native tongue, and the nation yielded gradually to the sway of a priesthood more powerful there than in any other country acknowledging Budhuism. Srongdsan Gambo transplanted his residence from the sources of the Yarlung, in Kokonor, (a tributary of the Yangtze,) to L'hassa. A princess of Nepaul, married to the king of Tibet, did very much for the propagation of this religion. She introduced the first images, and ordered temples to be raised superior to those in her native land. Many are the traditions of this person in the books of the Budhuists, and to her are ascribed the splendid structures on the Botala hill. The celebrated Tae-tsong, of the Tang dynasty (620-649), informed of the bravery of this race, and fearing, like his predecessors, their inroads, endeavoured to conciliate the good-will of Srongdsan Gambo, by bestowing upon him his daughter Yunching in marriage. This princess was a learned lady, who not only imported into her adopted country the treasures of her native literature, but likewise a library of Budhuistical works, together with a good many idols. Having erected two temples on the same hill at a great expense, she set to work in earnest to reform the barbarous habits of the people. Many rude customs were abolished; Chinese literati established themselves at the court, and instructed the natives in their language and poetry. It became fashionable among the chiefs to have a smattering of Chinese, and many noblemen sent their children to China for education. The king himself received the title of Prince of the Western Sea, and acknowledged himself a vassal of the Great Emperor. The nation adopted the Chinese calendar, introduced silk manufactures, and imported paper and ink—a proof of mental advancement.

In the ninth century the Lama worship seems to have obtained a still firmer footing. The Tang dynasty had ceased to be powerful, and after its overthrow the king of Tibet invaded China, and returned with an immense booty. This he spent in erecting monasteries, and endowing the existing establishments. He built the first nine-storied pagodas, from the models he had seen in China, and, to render the study of Budhuism more effective, he directed the translation of its principal works into the vulgar tongue. The most learned men were invited from Hindostan, and every talented individual found favour at his court. He had divided their monastic orders into bearers, thinkers, and preachers; thereby indicating the various degrees of friars, from the novice to the perfect priest. The country was in a flourishing condition, and every institution displayed vigour: the

national annals were carefully preserved; a considerable trade was carried on with Turkestan, Hindostan, and China; and the name of Tibet was favourably known in the neighbouring countries.

This did not last long. King Tama, who reigned from 902-925, filled with indignation at the power of the priests, commenced a persecution against them. They were butchered, their temples destroyed, and their holy books burnt. A civil war raged throughout the country, and the king divided the land amongst his two sons, one retaining his residence at L'hassa, another fixing his abode at Chashe-loumbo.

Central Asia, and consequently Tibet also, were in the tenth and eleventh centuries subjected to the most fearful revolutions. The rulers of Dsang were obliged to fly to Ari; whilst a great number of Lamas sought a refuge in Sefan. From this state the country was relieved by the Chinese emperor Kublai-Khan, who strongly supported the influence of the Dalai-Lama; and in the fifteenth century Shamanism became the ruling religion of Central Asia.

At the commencement of the seventeenth century, on the decline of the power of the Ming princes, the Tibetan nobility, under the direction of a spirited gyalbo, or king, resumed by main force their privileges. The Dalai-Lama was forced to yield, and lost much of his authority. From this depressed state he endeavoured to rescue himself by calling in the aid of the Kokonor Tartars, whose chief, Kooshe-Khan, came with a numerous horde, conquered and slew the gyalbo in a pitched battle, and declared himself the protector and vassal of the Dalai-Lama. From this height he was subsequently hurled by Tsewang-raptan, an adventurous Kal-muck prince, who afterwards attacked and sacked L'hassa.

The celebrated Chinese emperor, Kanghe, hearing of the ravages committed by these wild nomades in Tibet, and remembering that a Dalai-Lama made his court to his father, offered him his priestly homage, and decided in favour of the hierarchy. It was evident to him that as long as he had the ascendancy at L'hassa he would also be able to control the steppes. He accordingly marched a large army of Tatars from the N. into Tibet, and the followers of Tsewang-raptan were expelled.

Keenlung, emperor of China, resolved at length to abolish the temporal power, to make the Dalai-Lama sovereign under the strict surveillance of two ministers from China, and to treat Tibet henceforth as a conquered province.

In 1790 the Ghorkhas made an irruption into Tibet, and collected an immense plunder, but, surrounded by the Chinese on their return, they were obliged to give up the spoil.

In 1840, during the war between Great Britain and China, the

resident at L'hassa, fearing a hostile demonstration from India, besought the emperor to allow him to transport cannon from Szechuen, over the high mountains, to Tibet.

Keshin was for a short time minister at the court of Tibet (1845-1846); but he subsequently became governor-general of Szechuen, in this capacity holding a considerable control over Tibet.

The language of the Tibetans is original, and sufficiently proves that this nation is not descended from the same stock as the Mongols. Like the Chinese, it admits of no inflexion, has many monosyllables, but is in every respect fuller, more expressive, and euphonious. The various tribes, though living far from each other, exhibit no great difference in dialect. They are the K'hamba, the inhabitants of Khamjul; the Potba, natives of Udsang; the Brokpa and Horpa, the Nomades, &c. to the N. W. of L'hassa; the Naripa, in Lahdak, and Baltistan, and the Lbopa, who live in the S., towards Bhootan. The literature is bulky, but the contents are very meagre. Most of the works are of a religious nature, and for the greater part are mere translations from Budhuistical books. As the Pali engrosses the attention of the more intelligent part of the community, native literature has found very little favour.

The numerous tribes which inhabit the mountain recesses speak languages not connected with the Tibetan. They possess no alphabet, nor do they in any way show their connexion with the southern or Miaoutsze races by their vocabulary.

Shamanism, in all essential parts, resembles Budhuism; the ritual is the same, and the principal difference consists in the incarnations. At the head of all stands the Dalai-Lama, the very essence of Budha. The Banchin-Erdeni ranks next, and likewise possesses sovereign power. Of far inferior rank is the Taranath-Lama in the W., and the three leading priests of the red sect, viz., the Lam Rimbochay, Lam Nawangmamghi, and Lam Ghassatoo; the three Shamars in Bhootan.

On the death of the Dalai-Lama the Banchin-Erdeni becomes virtually the regent. The ceremony which then takes place is of the most costly and magnificent description. The Chinese authorities set to work in order to obtain the choice of a successor from a family favourable to the imperial rule, and no intrigues are spared in order to effect this purpose. Three years, however, are passed in prayers and ceremonies before ascertaining upon whom the incarnation has fallen, and three Lamas, descended from hereditary families at L'hassa, are nominated for this purpose. The choice is referred to the Banchin-Erdeni, to the council at L'hassa, and finally to the Emperor of China for acceptance, and generally falls upon a child.

The Banchin-Erdeni keeps up much less state, but the choice of his successor is made in a similar manner.

The Lamas are dressed in a vest of woollen cloth, with white sleeves, of a saffron colour, a large mantle resembling a shawl, a kelt, and huge boots lined with fur. The head is shaven, but they use a warm grotesque-looking cap, to protect themselves against the rigour of the winter.

The next person in authority to the Lama is the Naib, whose functions are both temporal and spiritual, and who performs the duties of the Lama during his minority. He has a council of four shubbahs or ministers under him, who deliberate upon all affairs of state. They are the creatures of the Chinese, and receive a salary from them. There are two debs (sheodebs), or governors; one for L'hassa and the other for the country at large. The Phompems superintend the financial matters, and the Bukhay is the commander-in-chief. There are, moreover, magistrates, and zoong-poons or collectors, and local governors. Tibet is said to maintain an army of above 60,000 men, a considerable part of which consists of cavalry. To explain this anomaly, we may observe that the great majority of these troops are nomades from the N., who perform military service as a kind of militia.

The punishments by law are very severe in Tibet, but are often evaded by the rich.

A white scarf, of the thinnest silk texture, is used on all occasions of ceremony, to be presented to friends and relations, and even a letter of ceremony cannot be sent without this appendage. Since the Chinese have taken possession of the country, a regular code of ceremonies has been instituted, in the observance of which the natives are as tenacious as their teachers.

The ministers (tacin) sent every third year from Peking to L'hassa are invariably Manchoos, often near relations of the Emperor, or statesmen who possess his entire confidence. They correspond in all important matters direct with their imperial master, and are intrusted with unlimited powers.

For form's sake they consult with the Dalai-Lama and his council, but in case of need address themselves to the Governor-General of Szechuen for troops, ammunition, and supplies. The civil establishment is very insignificant, consisting of a secretary and a few clerks and interpreters. The Chinese military force is only 646 rank and file at L'hassa; 782 at Chashe-loumbou, Tingri, and Keang; and along the road, to keep up the communication with China, about 3000 more regular troops. But a very strong corps of Dam Mongols, under the direct influence of the Chinese administration, encamps near the capital, and at the command of the resident, these boisterous barbarians are ready to pour into the city and invest the palaces of the priests. The

rulers of Nepaul appear submissive to the Chinese court, and regularly send tribute to Peking. When, in 1816, the English invaded Nepaul, the latter supplicated help from the Chinese, who assembled a considerable force on the frontiers. The total defeat of the Nepaulese prevented however their advance. During the late Anglo-Chinese war (1840) the Nepaulese are said to have offered to invade India; an offer which was not accepted, but Chinese rank and orders have since been conferred on the Nepaulese Rajah as well as his envoys. For military purposes Tibet is divided into 124 encampments or cantons, each of which has to furnish its contingent. The Chinese soldiers are regularly relieved from Szechuen, but many die in Tibet.

The Manchoo dynasty will not easily give up their dominion over Tibet, for on it depends the control over the Mongols, and on this the existence of the monarchy. Before Chinese influence prevailed in L'hassa, the Kalmucks and Mongols were constantly plotting against the imperial authority, but so soon as the Dalai-Lama became subservient to the Emperor, peace and quiet ensued amongst the rudest tribes. This metamorphosis of the most unruly hordes of Mongolia and Sangeria into the most obedient subjects, is perhaps without a parallel in history.

Sefan or *Soofan* borders to the N. on Kokonor, to the S. on the territory of the Noo and other wild tribes, to the E. on the Chinese provinces Szechuen and Kunsüh, and to the W. on Tibet; extending thus about 8° of lat., from 28° to 36°. The Yangtze (Kinsba or Booreitsew) and its tributary, the Yarlung-keang, are the principal rivers. The sources of the Yangtze are in 33° lat. (15° West, Peking), at the Choor-koole mountains. Its principal branch is called Choonak or the Hih-shunuy (Black water) by the Chinese. In picturesque grandeur no river in the world surpasses the Yangtze.

The valley along the banks of this river constitutes the most fertile part of the whole country, rich in pastures, and an excellent soil. Many towns adorn its banks, and they increase in the 32° of lat., where the country is less wild, and the valleys become more and more wide. Chonkor, farther S. Konkood-song, and Pa, the most southern, are worthy of mention. The river is in the 32° lat. already of considerable breadth. Towards Yunnan the small places Tonkerdsong and Chintam lie on its banks, and these may be looked upon as the principal fortresses towards China. The inhabitants there call themselves Mong, and are a tribe of Miaoutsze.

The Lon-tsang runs near the boundary in the direction of Tibet. The territory between the two rivers is traversed by a mountain chain. Several tribes, which have not yet adopted Shamanism, such as the Latons, farther S. the Pomsaras, and the

Dsanolos, live there, of whom the people of Sefan themselves know very little.

To the Charing and Oring lakes, in the N.W., we have already adverted. They are a continuation of the numerous Kokonor waters, and lie in a very large plain, the abode of nomades. Two small rivers run from the S. into the Oring.

To the Hwangho we have also alluded, though properly rising in Kokonor, not far N. of the Oring lake, one of the branches communicating even with its waters, which has given rise to the belief of its flowing from the lake. It describes in Sefan a curve, as far South as the $33^{\circ} 30'$, round a mass of mountains, each of which sends its tribute, so that above 30 streams fall into it on both sides, the valley through which it runs being very deep. Three rivers coming from the S.E., the Ton, Tomlato, and Soora, likewise join it. Having now become a considerable stream, and reached in its easterly course the 15° W. Peking, it all of a sudden turns N.W. On both banks there is much pasture ground, but farther North crags and rocks overtop the banks. The whole of the territory to the E. is of a similar nature, until approaching Kamsüh, where it becomes more flat.

Of a better description is the region S. of the Hwangho, which may be called *Sefan Proper*. The mountains are relieved by smiling valleys, adorned with numberless temples. The country is so promising that the Emperor Keenlung was tempted to incorporate a part of it with Szechuen, under the pretence of securing the frontier.

The Yarlungkeang (White River), the largest tributary of the Kinsha, under the name of the Tsächoo, rises in the neighbourhood of the Oring lake. Having received whilst running S.E. a great many tributaries, it takes in the 32° lat. the name of Minchoo, and running due S. forms, for a short distance, the boundary between Sefan and Szechuen. In about the 26° , where the Kinsha all on a sudden turns to the E., it flows into it. Between it and the Kinsha is the Wooleang, rising on the Pootoola mountains in the 31° lat., with the cities Tankerdsong and Larkenting on its banks.

Having reached Tatseën-loo, in lat. $30^{\circ} 8' 24''$, and long. $4^{\circ} 37' 40''$ W., Peking, we arrive at the Chinese military frontier station, whence troops and caravans start for Tibet. It has very good walls, and is otherwise well fortified in the Chinese way: there are about 50,000 inhabitants. Large fairs are annually held here, at which all articles of exportation and importation to and from Tibet are brought to the market. About 23 geographical miles W. of it flows the Yarlung Keang (White River). This river is crossed in summer and autumn in boats, but in winter and spring by a flying bridge, on account of the rapids. The ferry

is at a place called Barmajoossou (Chung too, or middle ferry), and a Chinese officer is here stationed as a guard, as well as a collector of duties. In this solitude is the cradle of the Tibetan race, where their ancestors lived, formed the nucleus of their empire, and thence subjected the country N. and W. It is, however, remarkable that the first king was descended from a foreign race, Gneathbree-zengo, the son of Makkeaba, the queen of Hindostan. He was first exposed as an infant, then taken under the protection of herdsmen, and subsequently raised to be their chief and leader. They seem to have led a roving life, and, if the history of China speaks true, gloried in making inroads upon their neighbours.

The road now turns N.W., and the first remarkable place through which it leads is Mukeandsong. From hence the real difficulties of the journey commence, and the traveller has not merely to contend with the elements and the evils of nature, but with robbers. The Chinese government has most laudably exerted itself to control these freebooters, who nevertheless plunder whole caravans. The largest army in those narrow defiles can scarcely prevent being surprised. On the Tho-langkung mountains the air is so rarefied that travellers complain of giddiness, and the blood often issues through the pores of the body. Many die in consequence suddenly, while others are unable to move, and are left to their fate by their more fortunate companions.

The next large place on the route is Léthang, which contains about 2000 inhabitants, mostly Tibetans, under the immediate government of a Lama. This is one of the principal passes, and is therefore strongly garrisoned.

Farther on there are still a few houses, as for instance at Ngewa-mang-sang, and other places; but the whole region becomes gradually more desolate; no living creature, not even an eagle, is to be seen, and the frost maintains, in deathlike silence, its undisputed empire. No provisions are procurable at the intermediate stations; and those who do not rapidly pass on are sure to be buried under ice and snow. The travellers sleep under felt tents, which form but an insufficient protection against the cold. The least noise detaches large masses of snow, and the travellers proceed therefore with the utmost silence.

Having crossed the Charlaï mountains, the traveller emerges into a more fertile country. Trees and verdure and living beings greet his eye; and the soil is cultivated in some spots.

The road leading S.W. finally brings the traveller to Bathóng (Pa in Chinese), a considerable settlement to the E. of the Kincha. This town lies in a very extensive valley, forming a total contrast to the regions hitherto traversed.

The Chinese government has during more than a century been in possession of this place, and ruled the surrounding country by native officers, acting under the direction of a mandarin. The dominion of this functionary is firmly established, as he has in employ a number of the Lamas. These become, therefore, the strongest advocates of Chinese rule, and inculcate upon the inhabitants complete submission.

Following along the rocky banks of the Kin-sha, the path leads to the ferry, which forms a very difficult transit. After having traversed the lofty Nin-ting mountain the traveller arrives in the territory of the Dalai-Lama. The first place in this new country is Nantun, where a fair is annually held, to promote the commerce between China and Tibet.

Instead of passing through the country of the aboriginal tribes, the road now turns N., until reaching Tsiampo Kham (the Chang-too of the Chinese). This is situated on an arm of the Lant-seang, in a miserable country under the government of one of the Ku-tuehtos, who has a host of Gylongs under his sway. There are here many temples, and one dedicated to the Emperor of China. The Northern part, Laton, consists of extensive pasturages, and several tribes of Mongols make this territory their constant abode.

The S., which borders on Birmah and Yunnan, is very little known. A small state, Amboa, consisting of fourteen cantons, is here found. The inhabitants exhibit excellent specimens of Tibetan civilisation, are as priest-ridden as their brethren, study the laws of Budhuism with the utmost attention, and appear to possess good natural talents. Several of the most distinguished Lamas were born in this country, and some have even been raised to the throne of L'hassa. Kahung, another small district in the neighbourhood, is inhabited by a very industrious agricultural race. S.W. dwell the wild H'lokba tribes, a race of the most determined savages, against whom all efforts of civilization have availed nothing. They live in their mountain fastnesses, as far as Assam, and disdain every foreign yoke.

Wheat, peas, rhubarb, and a few vegetables, are grown in Sefan. Fruit-trees and even vines, thrive in sheltered situations, but timber trees are seldom found. The horses are good, and the country exports excellent mules. The yak is also found in great perfection, and the sheep are numerous, and remarkable for their enormous tails. The camel is seen in the N. The mountains are rich in metallic treasures, and some iron, copper, silver, and gold are obtained from the mines.

Sefan (or *Western Foreigner*) is the name under which the country is known. Two distinct races may be discovered among the inhabitants. The one, evidently of Tibetan origin, maintains the language and customs of the kindred tribes, lives in fixed

abodes, and builds towns. This is the least numerous, and occupies the southern and central parts. More spread is the second race, not differing from the hordes of Kokonor, who always travel about in search of pasture, live in felt tents, and are in this respect Tatars in the fullest sense of the word. They live on meat, which they frequently eat raw, and dress in sheep skins, or a kind of woollen manufactured by their wives. Indigenous hemp furnishes them likewise with materials for making a kind of coarse but durable texture. The greatest art of the men consists in forging arms of the best tempered steel and framing graceful helmets. The smallpox sweeps away annually thousands from among them, and a person attacked is forthwith separated from all human society. In L'hassa there is a hospital for patients of this description, but the remedies applied prove often worse than the disease, and few survive them.

The Chinese distinguish the Sefanese into Hwang (yellow) and Hih (black), from the colour of their tents. The latter are by far the most numerous and powerful. Though they have no fixed dwellings, the pasture grounds of the nomades are carefully marked off, to prevent quarrels among the various tribes. Over each a nominal chief holds rule, who, in case of encroachment, has the right of complaining to the governors of Szechuen and Shense. The principal districts (Toosze), commencing in the N., according to the Chinese nomenclature, are Mung-kö-keë, Lin-tswin, Chun-ko-ching, Kō-urh-sze, Kū-urh-chō-woo, Kō-urh-kan-min-ma-shoo, Kō-urh-kung-chë, Kō-urh-pih-le, Shang-chen-tuy, Ha-chen-tuy, Hwa-sūh-maouya, La-kwān, Yu-ming-ching, with more than one hundred others, dispersed in the valleys in part of the country.

Tibet was long known to the Western world under the name of *Tangout*. The indefatigable Marco Polo was the first who gave some credible account of these unknown regions. Next to him the celebrated Andrada, at the commencement of the seventeenth century, visited Tibet from India. On this occasion he discovered the sources of the Ganges (Ganga?). The Capuchin mission at L'hassa and other places existed until the middle of the last century. As many of the rites practised by the Romish missionaries resembled those of Shamanism, the missionaries were at first looked upon as Lamas of the W. The missionaries possessed chapels and monasteries in several parts, and also in Nepaul. Since their disappearance the connexion with Russia has in some measure been opened; but nothing has yet been published on this subject to throw light upon its nature. Meyendorff, the enterprising traveller, traversed the land in the pay of his government. Shröder, a German Protestant missionary, sent from Calcutta, compiled a dictionary. More distinguished in

this field was the Hungarian, Csoma de Kosroes, who lived many years in the country. In useful researches no one exceeded Moorcroft. Since the establishment of the sanitary stations near the frontiers many tours have been undertaken by British officers, and some have returned with valuable information, principally relating to Lahdak. Mention might also be made of Turner's embassy to Chashe-lo-umboo and Abdul Russol's account of Tibet. The Chinese also have published statistical accounts and vocabularies of the language.

'Georgii Alphabetum Tibetanum' is an extraordinary work. The concerns of the mission are best described by M. Herrera's "Representacion sobre el estado actual de la mission de Thibet." Desideri's notes may be read with advantage. Du Halde's work on China, as well as Klaproth's Remarks and Hamilton's 'East India Gazetteer,' contain important remarks. The Tsanangssétsen, or Mongolian annals, throw some light upon the history, and the Chinese Repository has some very good articles on the country. The Chinese map recently published appears to be the best, as, since the survey executed at the beginning of the last century by Kanghe, very essential additions have been made; and in the 'Tat-sing hwayteen' some statistical accounts of the country are found.

XV.—*Notes on the Physical Geography of Palestine*.—Extracted from the Letters of Colonel Von WILDENBRUCH, late Prussian Consul-General in Syria, addressed to A. Petermann, Esq., Hon. Mem. of the Geogr. Society of Berlin, &c.

[Read June 25, 1849.]

It is well known that part of the Dead Sea can be seen from the Mount of Olives; and I confess that the appearance scarcely justifies our assuming so great a depression as it really proves to be. It is only when you gradually descend from Bethania, and more especially from Jericho, that you are aware of a continued, though scarcely perceptible, descent. You here advance in a perfect but greatly inclined plane. The reverse of this takes place with respect to the Lake of Tiberias. From the top of Mount Tabor you see both the Bay of Acre and the Lake of Tiberias (the northern extremity): you also can trace the course of the Jordan to the S. of the lake, not the river itself; but the deep channel through which it flows is strongly marked on the plain.

The plain at the foot of Mount Tabor, extending towards the Lake of Tiberias and the battle-field, is apparently but little elevated above the level of the sea. In riding from Mount Tabor through Khan-el-Tudjar towards Tabariah, a deep valley

opens, which appears to be much more depressed than 328 feet, as calculated by Symonds, taking into consideration the entire formation of the land between the Mediterranean and the Lake of Tiberias. Any one who has been in these parts (and I have discussed this point with many travellers) will coincide in this opinion. I know no better instance of that descent to the shores of the Lake of Tiberias than the road between Optechina and Trieste. Here Trieste and the sea appear to be almost under the feet of the traveller; and the same thing takes place with Tabarieh and the Lake of Gennesareth. I employed almost three-quarters of an hour in the descent. The road is winding but excellent, and sometimes very precipitous, and my horse was strong and fleet; it would therefore appear that there is no very considerable error in my measurement of this place (= 845* feet below the level of the Mediterranean). There can be but little difficulty, considering all that has been done, in determining these points in such parts of the Valley of the Jordan, as well as in such of the Wady el Arabah, as are on a level with the sea; and I anxiously hope for an opportunity of accomplishing this. I well know that at Jacob's Bridge I was not far from such a point, and I therefore endeavoured to follow the course of the river in a southern direction. I soon discovered, however, that this attempt exposed me to the loss of my barometer; and I proceeded only for three-quarters of an hour until I came to a mill, near which, on the eastern bank of the river, there is a square fort, which had been constructed by the crusaders. Here the Jordan (30 paces broad at Jacob's Bridge—the bridge as rebuilt by Jezair Pasha is 45 paces long) rushed headlong (and divided into many arms) at so rapid a rate that it might well be compared to a continuous waterfall. The banks were covered with vegetation, so thick as almost to conceal it. Although I can trust to my bodily strength, I did not venture to bathe below the bridge; and as the river above it is marshy, I chose for that purpose a canal about $3\frac{1}{2}$ feet deep, which conducts the water to a mill with much less fall. But even here I found the current so strong that, to prevent my being carried away, I was obliged to hold by the overhanging boughs, and did not care how soon I left that unpleasant position. I had sufficient opportunity to ascertain that the river is almost stagnant from *Lake Hûleh* to the bridge; and I had there some tolerably good angling. The marshy nature of the lake (*Hûleh*), and the fact of its surface extending over a greater or less portion of its bed, according to the season of the year, makes it impossible to determine its form and size with accuracy.

* According to the late American survey 652 feet. See also 'Journal of the Royal Geographical Society,' 1848, pp. 77 and 89, for the articles by Dr. Robinson and Mr. Petermann.—Ed.

From *Jisr Benat Yakub* (Jacob's Bridge) you ride, at quick pace, uphill for about $\frac{1}{4}$ of an hour, when the valley of the Jordan widens. Up to this point it was about $\frac{1}{2}$ an hour wide, and formed by hills from 400 to 500 feet high, covered with brushwood. On the top of the last height of the western border of the valley, about 2000 feet from the outlet of the Jordan, and 200 paces from the Jordan itself towards the W., without correction of the needle,—

Outlet of the Jordan from the lake bore N. 15° E.

Highest point of *Jebel el Sheikh* „ N. 34° E.

Greatest width of the lake, from N. 15° W. to N. 36° E.

Tell Keissar (apparently an artificial mound on the lake), N. 4° W.

Castle Hunin (in the *Blad Bsharah*, belonging to the noble family of Muhammed-el-Bey), N. 30° W.

Close to the Jordan, due E. from this spot, on the right, *i. e.* the eastern bank of the river, is a tower: $\frac{1}{4}$ an hour from here to *Tell Keissar*. The bed of the lake is about 2 hours (or 4 geo. miles) wide. The lake is full of aquatic plants. To the W. occurs the low mountain-range of *Blad Bsharah*, and magnificent fields of wheat extend to its foot.

From the bridge to *Tell Keissar*, $\frac{1}{4}$ of an hour.

From *Tell Keissar*: *Jebel Sheikh* (highest point) N. 31° W.

Hunin, N. 42° W.

Direction of the shore of the lake to *Ain-el-Mellaka*, N. 42° W.

Outlet of the Jordan, and direction of the shore towards it, S. 34° E.

Proceeded along the bank towards *Hunin* and *Ain-el-Mellaka*, for 35 minutes. Here (after 35 minutes) is the widest expanse of the lake, which I estimate at $1\frac{1}{2}$ hours. The western shore of the lake is flat, covered with reeds, and marshy. On the eastern occurs a range of steep heights, the continuation of which forms the eastern border of the Jordan valley. From this point to *Ain-el-Mellaka*, $\frac{1}{4}$ hour; three Tells (artificial mounds) on the shore of the lake. From that widest part the road to *Ain-el-Mellaka* turns N. 52° W.: ruined village and mill; rapid streams flowing to the lake. The sea of reeds began this season (24th April) at *Ain-el-Mellaka*. I understand that in winter water is said to stand for 2·2 geo. miles beyond *Ain-el-Mellaka*. From *Ain-el-Mellaka* to the end of the sea of reeds and the beginning of meadows 1 hour. Here you change the direction you have hitherto followed, and turn eastward towards *Banias*: then meadows and rice-fields. From the point where the sea of reeds ends to *Nahr-el-Halfa*, $1\frac{1}{2}$ hour: (confluence of the *Hasbany*); from thence to a magnificent Roman bridge across the *Nahr Hasbany* (which may be considered as the true Jordan), 1 hour. From thence to *Tell-*

el-Kady, 2 hours. The *Kalaat* (castle) *Banias* is $1\frac{1}{2}$ hour distant from *Tell-el-Kady* (steep ascent); *Banias* itself, 1 hour: bearing E. 87° S.

	Distance.	Bearing.
From Castle <i>Banias</i> ,	<i>Majdel</i> , village, $1\frac{1}{2}$ h.	N. 72° E.
	<i>Jebbara</i> , id. 1 h.	N. $71^{\circ}5$ E.
	<i>Hazzour</i> , ruins, $\frac{1}{2}$ h.	N. 87° E.
In <i>Jebel Sheikh</i>	<i>Haurit</i> , id. 2 h.	E. 54° S.
	<i>Aukunna</i> , village 1 h.	E. 43° S.
	<i>Zaoura</i> , id. 1 h.	S. 10° W.

Apparent western point of the lake	
from <i>Huleh</i> to <i>Ain el Mellaka</i>	S. 33° W.
<i>Castle Hunin</i>	S. 76° W.
<i>Abil</i> , village, about 4 h.	W. 81° N.
<i>Ghagar</i> , vill., „ 2 $\frac{1}{2}$ h.	W. 72° N.
<i>Sarada</i> , 3 h. beyond the last.	W. $71^{\circ}5$ N.
<i>Kufret Sheba</i> , 1 h. (in <i>Jebel Sheikh</i>).	W. 36° N.

The following villages are said to be in *Jebel-el-Sheikh*, but they are not visible:—*Kefr-Hammeh*, *Hubbarieh*, *Mimis*, *Shvoia*, *Kfei*, *Ainata*, *Resheia*, *Ain-fit*, *Bkeifa*, *Aina*, *Kefr-kouk*, *Jinnai*, *Haurassa* (ruins), *Kefr-Dura* (ruins), *Bsheideh*, *Ghagar*.

In *Zaoura* and *Ghagar* the inhabitants are *Nussairians*, the only ones in this district, and probably in the whole of Southern Syria.

I have yet to observe, that I do not at all agree with *Dr. Robinson*, when he says that future researches alone will enable us to determine the elevation of *Cute-Syria* above the sea, since the estimates which had been made hitherto raise it *far too high*. I believe that it is exactly on this point that I can refer to my section of the country between *Beyruth* and *Damascus* with more confidence than on any other observations; because in this case I had the use of one of *Eckling's* hypsometers, which had been proved by the most competent men of *Vienna*; and a second hypsometer served to make simultaneous observations at *Beyruth* (at 8 o'clock in the morning, 12 o'clock at noon, and 5 o'clock in the evening). Although I have left all my books and papers in Syria, I still find from some notes that I calculated *Baalbek* at an elevation of 3332·34 (*Paris* feet), by means of the barometer. *Schubert's* estimate is 3572 feet; *Russegger's*, 3496 feet; consequently the greatest variation is only 240 feet. I do not see why—the suppositions of *Dr. Robinson* not being proved—we should all of us have been wrong.

Mere inspection shows that *El Bekaa*, or *Bukaah*, is a high plain; and more especially the circumstance, that in order to descend into it one hour is sufficient to get from the highest foot of the *Lebanon* to *Mekseh*, on the *Damascus* road; and that foot

is 5032·3 feet high, according to my calculations. The date-tree grows neither in the *Bukaah* nor at Damascus; but there are some beautiful specimens of it in the Lebanon, at an elevation of almost 2000 feet (at *Ain-Anoub* and *Deir-el-Kammar*). In winter the snow often remains lying for days together in the *Bukaah*; while it scarcely covers the ground for a single day on the slope of the Lebanon, facing the sea, even at the height of more than 3000 feet. The surface of the Leontes (*Littany*, but commonly *Kasmieh*) at the bridge of *Merj* (in the middle of the *Bukaah*, and about 5 hours south of *Baalbek*) was calculated by me at 2879 feet, by means of the boiling apparatus. I find in my notes that from *Khan-el-akmar* to *Baalbek*, one ascends considerably, although in the plain; and that from thence to *Mallaha*, near *Zahleh*, and down to *Merj*, one descends. I do not remember whether Dr. Robinson saw the Leontes anywhere else but at its mouth, yet I have crossed it at four or five different places in the *Bukaah*; once at the point where it breaks through the mountain, and four or five times at its mouth. In ancient Coele-Syria it flows calmly and quietly, its bed not being narrowed by any rocks, and the mass of its water being diminished by innumerable canals for the irrigation of the fields; nevertheless it flows very rapidly. After its entrance into the mountains the *Kasmieh* changes into a mountain-torrent, which precipitates itself from rock to rock; and it is only for about $\frac{1}{2}$ an hour before reaching its mouth, where it issues from the mountains into the narrow plain along the sea shore, that it again flows slowly and quietly through the meadows. From its mouth up to its issue from the *Bukaah* and entrance into the Lebanon, there are only *seven* places at which it can be crossed; and I understand that it is only at these spots that it is possible to approach its banks. These points when it can be crossed are, beginning from its mouth, the following:—

1. *Jisr* (bridge) *el Kasmieh*, close to the sea; on the road between *Saida* and *Tür*.
2. *Jisr el Akai* (said to be at 4 hours' distance from the mouth).
3. *Jisr el Khardali*. We here crossed the river on our way from Jerusalem, Naplus, the so-called sources of the Jordan, Baniyas, and *Merj Aioun*. It was about 30 feet wide, and fell in cascades. About 1500 feet perpendicularly above the bridge, there is on its northern bank the magnificent castle *Kalaat es Shkif* (Belfort) in good repair. We ascended to it in order to get on to the high plain of the *Blad Bsharah*, which is exclusively inhabited by *Mutanalis*. According to my barometrical measurement, it appears that the level of the Leontes is here 524 feet above the sea.

4. *Jisr el Khatueh*, said to be at 2 hours' distance above the preceding.

5. *Jisr el Burghuz*, 2½ hours further than the last.

6. *Jisr el Meshghara*.

7. *Jisr el Karaoun*. They say that at this bridge a considerable rivulet, *Neba el Feluj*, falls into the Kasmieh.

Mr. Petermann's Note, containing Tabular Summary, &c.

Note.—The following *Tabular Summary* I had compiled from published works on Palestine, to accompany a *Climatological* diagram, which has since appeared in the General Physical Map of Palestine in my 'Physical Atlas.' It only pretends to give the principal characteristic features of every month.

Climatological History of the Months in Palestine.

(Progress of the Seasons as indicated by that of Vegetation.)

January.—Country verdant with young corn; groves and meadows adorned with many flowers; almond-tree and peach-tree in blossom.

February.—In the lower and warmer parts orange-tree laden with ripe fruit.

March.—All trees in full leaf, many in bloom. In the lowlands, orange and lemon trees laden with fruit; palm-tree blossoms; barley begins to ripen.

April.—Oleander flowers, and white mulberry fruit ripens; barley harvest; wheat harvest begins in the valleys.

May.—Principal harvest month, especially of wheat; apricots and apples ripen. In the Jordan valley vegetation is withered and burnt up.

June.—Grapes begin to ripen; almonds ripe. (Beyrout honey of the Jordan valley collected in May, June, and July.)

July.—Various fruits: apples, pears, plums, dates, &c.; olives begin to ripen, grapes fully ripe; pumpkins.

August.—Principal fruit month, olives ripe.

September.—Commencement of vintage; harvest of the dourra and maize; cotton and pomegranate ripens.

October.—Month of vintage; gathering of cotton; ploughing and sowing commences; pistachio-nuts ripen.

November.—Month of ploughing and sowing; rice harvest; fig-trees, of which there are many varieties, laden with fruit.

December.—Trees lose their leaves; the brown and desolate plains and deserts become green pastures.

(The preceding table I sent to Col. von Wildenbruch, with the request to revise and correct it from his own personal observations. His reply is as follows:—)

.... I hope that the following little table will be of some use to you for your *Climatological* researches. All this refers to *Beyruth* and the sea coast.

January.—The country green and blooming; heavy rains and storms (in Syria I never experienced rain without storms); anemones, narcissus, crocus, cyclamina flower; oranges begin to ripen, and orange, as well as citron and lemon trees, &c., cease to bloom, *i. e.*, they continue to bear blossoms, but less copiously, for in fact they never cease to blossom, except for two or three summer months. Snipes, ducks, plovers, storks, herons, cranes, and wild geese visit the plains; the woodcock moves to the north in the middle of the month: pink, geranium, and orange blossoms flourish in the plains throughout the year, as do the cyclamina in the mountains.

February.—Almond, peach-trees, and ficus indica in full bloom (the

almond-tree does not blossom in January, as you suppose). The above-named trees continue to blossom; oranges are ripe; storks, cranes, plovers, starlings, and green plovers assemble in great flights, and move northwards about the middle of the month; a few quails arrive from the south; partridges pair (middle of the month); heavy rains with storms. Towards the end of the month *khamzin*. (Simoom.)

March.—All is green. In the fields, wheat and barley come into ear; poppies, and a very beautiful pink-coloured flower, as well as a red sort of lily, blossom. The palm-tree and the vinegar-tree (Arab, *salsilakh*) are in bloom; the sugar-cane (growing wild), about 8 feet long, is being sold in the streets; quails arrive in great flights; rains with thunder-storms, *khamzin*.

April.—Pomegranate, rose, and vine blossom; oleander begins to bloom at the end of the month; quails begin to move N.W.; the landrail arrives; occasional rains; *khamzin*.

May.—In the valley of the Jordan, harvest in the beginning of the month; cucumbers ripe at this time; oleanders, malvæ, capers, blossom throughout the month. On the mountains rhododendrons (I have only seen rhododendrons at an elevation of at least 5000 feet) in great beauty; apricots, cherries (only at Damascus); plums are ripe. The silkworm changes into a chrysalis; the mulberry, of which the branches are cut off at this time, reproduces them 4 feet long in a month. Occasional and slight rains in the first half of the month; they then cease altogether, and until the middle of October no rain ever falls on the mountains. Young partridges at the end of the month; quails and crows disappear.

June.—Corn harvest in the beginning of the month; almonds, cucumbers, and some sorts of pumpkins are ripe; the *bee-eater* appears in flocks towards the end of the month.

July.—Apples, pears, and peaches ripen, but olives are not mature in this month, as you suppose; the dates are never fit to eat in Syria at this time, though they may be so at Alexandria. Towards the end of the month early grapes and Indian figs are ripe; at the same period corn harvest occurs on the high hills.

August.—Figs, grapes, water-melons ripen, also walnuts in the plain, and olives; partridges lay eggs towards the end of the month.

September.—Later grapes and figs of all sorts are ripe (at *Kurnayt*, 4100 Paris feet, there are fourteen different varieties). Harvest of dourra and maize. (I do not know the time when cotton is gathered, but I believe that since the reoccupation of Syria by the Turks, the cultivation of it has almost entirely ceased in this country.) The pomegranate ripens at the end of September, as well as the walnut in the high hills.

October.—Vintage on the hills; about the middle of the month the first storms with slight rains occur, in the hills generally eight days earlier than on the coast. Sometimes, however, these rains do not begin before November. Ploughing and other field preparations depend upon the quantity, as well as the period of the commencement, of these rains. Pomegranates are ripe, and the latest sorts of figs (*schittawi*) are gathered after the first rain; the quail begins to move S.W. towards the end of the month.

November.—Now ploughing and rice harvest take place. I have seen rice-fields in Syria only near the lake *Huleh*. Latest grapes in the hills. The quail migrates south; the mulberry loses its leaves towards the end of the month; orange and citron trees put forth rich bloom at this time; heavy rains and storms.

December.—The trees which are not evergreen lose their leaves; the country is verdant. Towards Christmas the first ripe oranges are seen; lemon-trees bear fruit throughout the entire year. (A single tree in my garden

yielded the whole supply for my household, which was very considerable; and yet, regardless of the great consumption which was made of it in the kitchen for sorbets, lemonade, &c., all wooden utensils, kitchen tables, &c., were cleaned with lemon acid.) Woodcocks arrive in the beginning, but snipes, storks, cranes, fieldfares, &c., not till the middle of December.

Permanent Snow.—In the Lebanon, except the Sannin, permanent snow lies only on the highest crest of the mountain range, at the beginning of *Wady Kadisheh* (the holy valley), above *Kanobin* and the cedars, north of the road which leads from *Bsharah* to *Ainuta*, *Khan-el-Akmar*, and *Baalbek*. This highest crest is called *Makmil*. I estimated the summit of *Fun el Mezreb* (by the side of which there is a peak apparently of the same height, and from *Baalbek* both peaks appear as the highest of the Lebanon) at 9027·36 *Paris* feet, the Sannin being fixed at 8772·5 (hypsometer). On the western side the snow only lies in the chasms between the rocks, and it disappears as early as the end of May from the surface of the hills; but on the eastern side it continues to lie on the surface even during the summer months, especially when there has been a copious fall, though it is then seen alone in stripes of 15 or 20 square *ruthen** at the most. On the plateau of the Sannin it lies in the crevices and crater-like hollows in immense quantities, and forms a compact mass, which the inhabitants of the plains cut up with hatchets. Forty mules are employed in conveying this snow to *Beyruth* from May to November. On the top of *Jebel Sheikh* there is more snow than on the Lebanon; still, even there, although of course I did not ascend its summit, I did not see any continuous snow-fields. The transport of the snow from this mountain to Damascus requires 400 mules. On no other heights of the Lebanon, except those mentioned (two of the *Makmil* and the *Sannin*) does any snow remain, but in winter it continues on the ground at *Kurnayl* (4100 feet) sometimes for two or three days; at an elevation of 2000 feet, on the side next the sea, it never remains, even for a few hours. Indeed, during a residence of five years in Syria, I have only once seen snow at such an elevation (at *Beit Meri*, *Brumara*, &c. &c.). In the *Bukaah* the snow sometimes continues on the ground for some days. Last winter, as I learn by letters, it lasted for some weeks. The annals of the family *Shehab* mention that once (about one hundred years ago, as I have not got the book with me I cannot be exact) there had been deep snow at *Beyruth*.

Throughout Syria the date-palm (*Phoenix dactylifera*) only grows wild; it is nowhere cultivated as in Egypt, nor is it used in any way. The highest point in the Lebanon at which I found this tree is *Ain Anoub* (on the road from *Beyruth* to *Deir el Kammar*). I estimate the height of that village at 1500 to 1600 feet, but I have not measured it: this estimate, however, cannot be far from the truth, for *Shunlan*, which is above *Ain Anoub*, is 1874 feet. There are no palm-trees either at Damascus, Jerusalem, or in the *Bukaah*, nor have I ever found any other sort of palm than the date-tree. It is said that near *Ghassa* the date is in some degree eatable, but the banana (*Musa Paradisiaca*) thrives along the whole coast, and becomes very palatable, although not quite so good as the Egyptian. I cannot from memory fix the period when it ripens; this is occasioned by the circumstance that this fruit is cut off before it is mature, and hung up in the pantries, where it becomes ripe by degrees. We thus had bananas from autumn through the whole winter. The culture of the vine and of the mulberry tree extends beyond the villages which occupy the highest elevations in the Lebanon; so with regard to rye and corn—of course only on spots where they will grow.

The village *Harroun*, 4966 feet high, from which I reached the cedars (the elevation at which they grow I found to be 5534·89 feet) after a march

* Equal to about 150 to 200 acres.

of two and a half hours, offers the most magnificent appearance in respect of this sort of cultivation. Such is also the case at *Bsherréh*, which lies on the northern side of *Wady Kadisheh*, at the same elevation, and opposite to *Hasroun*.

I extract the following notes from a description of an excursion I made in 1843 across the northern Lebanon:—

	<i>Paris feet.</i>
<i>Shunlan</i> (starting point)	1874
Pass over the crest to <i>Zahleh</i>	4923
Natural bridge, source of <i>Nahr el Kelb</i>	4622
Source of <i>Nahr Ibrahim</i>	5604
<i>Hasroun</i>	4966
Cedars	5535
<i>Ainata</i> (on the declivity toward Baalbek)	4656
<i>Baalbek</i>	3332
Pass over the Lebanon, on the road from Beyruth to Damascus	4550

These measurements were made with the barometer, and from corresponding observations taken at Beyruth. All the measurements by barometer gave a smaller result than those which I subsequently had occasion to make with the hypsometer of Ekling. This difference is very considerable with regard to the pass over the Lebanon between Beyruth and Damascus. The measurement by means of the hypsometer (though, it is true, under unfavourable circumstances) gave for this pass (*Mughissah*) 5013 feet. Which is right?

I subjoin my section of the country between Beyruth and Damascus. The number of the 'Annals' * in which it is published contains, among others, the following remarks in this essay.

The heights were determined in 1846 by means of two hypsometers, which were constructed at Vienna by Ekling, under the direction of Professor Baumgärtner, and they had been made in accordance with directions given in the Introduction to Professor Gintès' work 'On Measuring Heights,' and expressed in *Paris* feet. One of these instruments was observed five times in the day by Mr. Blanche, tutor in the house of the French Consul-General at Beyruth.

Khan Rouissat el hamr (khan of the red cupolas) was fixed barometrically in 1843 at 3616 feet; *Khan Murad*, at the same time, at 4000 feet. With regard to the highest point of the road across the Lebanon, I refer to my former observation. A violent and cold wind caused a continual vibration of the column of quicksilver in my thermometer. From the village *Medjel* to the mill at Barrada there is no inhabited place.

XVI.—Notes on the Present State of the Geography of some Parts of Africa. By JAMES MACQUEEN, Esq.

(Read April 8 and June 10, 1850.)

In accordance with the desire of the President, I proceed to lay before the Society, as concisely as possible, a summary of the Geography of Central Africa, several degrees to the north and to the south of the equator towards the Indian Ocean. I shall commence with the lake to the N. of the tropic of Capricorn, and

* Monatsberichte der Gesellschaft für Erdkunde zu Berlin, Neue Folge, 4 Band, 1847.

the countries, rivers, &c. to the S. and to the E. of it, as these have been brought before us more prominently by the late journeys of Messrs. Livingston, Oswell, and Murray.

With Mr. Oswell I had considerable communication before he left England, and received from him and from Captain Vardon, his fellow traveller, much information concerning the parts which they had visited but a short time before. The pleasure of their acquaintance I owe to my late lamented friend, Sir William Harris, whose introduction was sufficient to assure me that they were men of energy and intelligence. On Mr. Oswell's leaving England I drew up for him a map, to serve as a guide, or to be corrected by him during his hazardous enterprise. The *Lake* was placed on the map exactly as it now stands.*

The Limpopo and its tributary streams terminate in the Indian Ocean, probably to the S. of Chulawan and Holy Islands. When Mr. Moffatt, on his late visit to Moselakatse, was on the banks of the Limpopo, he fell in with a man of the Baquiana tribe, who had been the guide of Dr. Cowan and his colleagues in their journey from the Cape of Good Hope through the interior, towards the Portuguese settlements on the E. coast, and who conducted them from his country in a N. E. direction until they had crossed a large river which runs eastward to the Indian Ocean, where he left them; they intending to proceed down its banks, and thence to Sofala. This is important, as Captain Owen was informed at Sofala that the travellers alluded to had been murdered about twelve days' journey in the interior. Captain William Cook was informed at Quilimane, by a man who had travelled much into the interior to the S.W., that such was really the fate of the unfortunate travellers. They had formed a kind of stockade, in order to defend themselves against the attacks of a formidable body of natives, but in which they were overpowered and massacred. These facts leave little doubt as to the fate of these unfortunate travellers; the part of the country in which it took place, and also that the course of the river Limpopo and its tributaries is to the Indian Ocean at the point mentioned, even did not the Delta and streams which, through it, enter the sea at that place—in my opinion establish the fact.

The Bamangwata tribe is noted above the others for industry and wealth. Considerably to the N. of them is a tribe named Bamagalalabili; and beyond them, to the N.E., is found a people half white—the real Zooloos—or, probably, the descendants of

* For an account of the lake and the surrounding country, I must refer to my paper read before this Society in the Spring of 1845, and published in September the same year, in the 'Colonial Magazine.' See also the 'Journal of the Royal Geographical Society,' No. 1. of Vol. XX. for the expedition to the lake, by Messrs. Livingston, Oswell, and Murray, with Map by Arrowsmith.

some of the early Portuguese settlers from the shores of the Indian Ocean. All the countries to the N. and the E. of the Baquiana tribe are said to abound in rivers, and to be hilly, woody, populous, and fruitful.

It is a proof of their general accuracy, that the early Portuguese African discoverers pointedly mentioned a large lake in the interior, in a direction nearly W. from Sofala, and at a distance from the sea (60 days) corresponding with the position of the Lake Mokoro.*

Several particulars of interest appeared in the South African Journals in 1845, on Mr. Livingston's authority; such as, "that to the N.E. of the lake the country became very mountainous, and was inhabited by a tribe called Maahana, who purchased guns from the Portuguese traders at Sofala through the medium of the Motaquare traders."†

Mr. Livingston, at the time of his first journey, resided at Mobatse, and travelled from this N.E. by Secbele. He now resides at Kolobeng, in $24^{\circ} 50'$ S. lat., and $25^{\circ} 10'$ E. long., from which place he states, in a letter to Mr. Oswell, that the lake bore N.N.W.; that is, considering the bearing to be by compass, and the variation two points about due N. The Bamangwata tribe reside N.E. from Kolobeng, about 16 miles W. of the Bakaas.

According to Mr. Oswell's first journey the Bakaa hills were, by actual observation, in $21^{\circ} 45'$ S. lat. Protracting carefully the routes in bearings and distances from Mabotse, the E. end of the Bakaa hills lies in $27^{\circ} 40'$ E. long. From this point the lake bore N.W., distant about 12 days' journey on foot, 24 days by waggon—say, 200 miles. The country from Mobatse to the N. was first very rugged and mountainous, then flat and barren, scantily supplied with water, and in several places exhibiting remains of volcanic craters. At Lupapi a fine sheet of water in a depressed volcanic basin was found.

The Bakaa hills rise from about 200 to 300 feet above the adjacent country. There are many cornfields amongst them. The air is very pure and wholesome, and, at the time they were there (the end of June), the cold at night was so severe that it froze the water to a solid mass, which for that latitude, even although it was the winter season, proves a considerable elevation.

Traversing the Bakaa hills to the W., Mr. Oswell and party turned S.E., and descended on the second day to the Limpopo,

* In my 'Geographical Survey of Africa,' No. XVIII., p. 264, the centre of this lake was placed at 20° S. lat., and about $23\frac{1}{2}^{\circ}$ E. long., the starting point Latakoo being taken 2° too much to the west. Lake Demboa in S. lat. 19° and E. long. 19° .

† Mr. Parker told me that he had visited the lake at a later period, and gave me his route (N.W.) and time from Delagoa Bay. He stated that it received a river on the S.W., and that, according to native information, one ran from it to the N.E.

which they crossed and travelled near the stream on its right bank a considerable distance to the eastward, passing in their route first the river Mikolwe from the S.E., which, at its junction with the Limpopo, is 150 yards broad. They re-crossed the Limpopo a few miles from Lingwapa,* near the junction of the Liphhalala, another considerable stream coming from the S.E. Below that, and more to the E., the Limpopo is joined from the S. by another stream, called the Moholoquane, said to be connected with the Elephant river.

On the N. side, and above Lingwapa, the Limpopo is joined by several small rivers, one of which, to the N. of the Bakaa mountains, called the Matokesane, is the largest, and flows into the Limpopo a little above its junction with the Mikolwe. Where the travellers crossed the Limpopo, near Lingwapa, it was about 250 yards broad, above 4 feet deep, and with a considerable current. This was during the *dry* season. The banks were 20 feet high, steep, with indications that when in flood the river filled them, but without overflowing. Near this place there is a small conical hill about 500 feet high, from the top of which the Limpopo can be seen bending its course towards the E.N.E. From Lingwapa the Limpopo is joined by several small rivers from the N.W., while the Shazie, or Shazanie, 60 miles from Lingwapa, was described by the natives as a *large* river flowing from the lake.† Eastward of Lingwapa the country is generally flat on the *north* side of the river, with a few conical low hills; and on the *south* side of the river the country is populous, hilly, and thickly wooded. Below the Mikolwe the banks are infested with the fly (*Setsé*), which is most destructive to cattle and horses. It seems to be of the same description of insects as those which Bruce tells us infest the country to the N. of the junction of the Blue and the White Nile at the commencement of the rainy season.

Leaving here the Limpopo, or, as it ought more properly to be called, the Ouri or Oori, in about 22° S. lat. and 30° 30' E. long., pursuing its course in an E.N.E. direction, let us turn to the map, where we find to the southward of Chulawan, or Holy Islands, between 21° and 21° 31' S. lat., a low *delta*, intersected with several streams, all of which were reported to Owen to come from one great river in the interior. Of these streams the *Govooro* was the largest. It was, says Owen, small at its mouth, but a superb river in the interior. South of it is the *Moronome*, also a stream of considerable magnitude. In this part the mountains are at a

* In about 30° 30' E. long. and 22° S. lat.

† The rivers joining the Limpopo from the N. side to the E. of Lingwapa, are the Lotsane, the Lebete, the Motniste, or Macloreste, and the Shazie, or the Shazanie. Mr. Oswald was probably misinformed respecting the Shazie being the largest, and that it came from the lake.

considerable distance from the sea. The mouths of these streams are, like those of many other African rivers, blocked up by sand banks which the currents and terrible surfs roll in upon them. In this portion of the African coast I consider the mouth or mouths of the Limpopo or Oori to lie, and the name *Govooro* is to me a strong presumption in proof. From Lingwapa to this point is 240 geographical miles, almost in a direct line, and all accounts agree that the Oori in its lower course becomes a magnificent stream. The Dutch farmers or boers, who have spread over this portion of Africa a long way to the north, informed Mr. Livingston "that the Oori becomes a very large river, and that it does not go to Delagoa Bay, *but enters the sea by its own proper mouth and name a little to the north of that Bay.*"*

In lat. $24^{\circ} 50'$ S. there is the mouth of the Rio Oro, Ouro, or Gold River of the Portuguese, which names identify this stream with the Oori, providing the Govooro is not the termination of this important stream. I cling at present to this opinion as it gives to that portion of Africa a more natural geographical appearance, and at the same time leaves sufficient space for the *Imham-bane* and other rivers which enter the Indian Ocean in that portion of Eastern Africa. Mr. Parker, who affirmed that he travelled from Delagoa Bay N.W. to the lake, told me that after passing the Liomba Mountains, he at the end of nine days found the rivers running to the N.E., which statement, if right, I conceive, settles the point, that the Great Lesuto and its tributaries form the parent stream of, or a large tributary to, the Manice or St. George River, which, be it recollected, Owen's surveying party left issuing from the mountains to the W. The Mapoota, the southern stream, is a small river (a mere mountain stream), and

* On the 7th September, 1844, Mr. Livingston writes Mr. Oswell (addressed to India) thus:—"The Limpopo runs and flows nearly E. after it goes beyond your farthest point in its course last year, as the boers (Dutch farmers) *saw it entering the sea a little to the N. of Delagoa Bay.* The country becomes densely wooded to the N.E., and filled with elephants."

On the 22nd March, 1847, Mr. Livingston again writes Mr. Oswell (addressed to India), accompanied by a rough delineation of the river, and two of its southern tributaries, the name of the one being the Lepinola (Liphalala), but the name of the other he had forgotten. The river, he says, receives, first the Lepinola, and then the other river; after which it makes a sweep away back to the N.E. The boers declare that it enters the sea a little to the N. of Delagoa Bay; that it becomes an immense stream—the mother of all rivers, after receiving the rivers mentioned.

On the 10th April, 1848, Mr. Livingston again writes Mr. Oswell (addressed to England) from Kolobeng, thus:—"I see no reason to dissent from the opinions, that the Limpopo goes so far N. (lat. Bakaa Mountain), but still it turns again more S., and then again to the N.E. There exists a range of very high hills N.E. of the Batnapele. I believe it quite possible that your nothing may be correct, by supposing that the river first makes a great bend S." He then adds, "I must now say a word on the course to the lake; the route is N.N.W. from this, and for a considerable part of the way, and waggons can go on till within eight days of the water," &c.

at the point where the explorers left it (62 miles from the sea), was stated to rise in the mountains about 20 miles distant to the S.W. or S.W. by S. These mountains are a continuation of the Liomba range, stretching S.W. till it joins the Drakenberg chain in about $27^{\circ} 30'$ S. lat. and 30° E. long. The Great Lesuto (before its junction with some of its tributaries), nearly equal to itself in size, divides into two channels, 25 yards broad each, very rapid, and scarcely fordable at some distance from Lotete, the capital.

E.N.E. of the lake the mountains are reported to be covered with snow, and the circumstance that the supplies to the lake come from the N. and N.W. is of great importance, as it discloses to our view the sources of the great streams which, with others coming from the central districts more to the N., form the great river, which enters the sea in $17^{\circ} 50'$ S. lat., and of which Nourse' river is probably a branch. The river alluded to is a very large stream, even during the dry season, much larger than the Orange river, where it enters the Atlantic. Mr. Cook, a Wesleyan missionary, states that round the sources of the Kuisip and Swakop rivers the cold is very severe, and that the E. wind is always most piercing and cold, proving that it must come from very high mountains. The earliest Portuguese navigators called the high mountain chain, which they were told existed in this portion of Africa, "the Mountains of the Moon," that is meaning simply exceeding high mountains.

Mr. Cook also says that northward and north eastward of the Damaras of the plains the country becomes well watered, populous, and abounding with cattle and provisions. Mr. Kolbe, another missionary, says, "the south part of the Damara country, near 22° S. lat., is mountainous, the northern part flat, with small hillocks covered with wild heath, grass, and bushes. The streams fail in the dry season, but numerous large trees grow and thrive on their banks, and move to the N. and the N.E. Other streams contain water throughout the year." The Damaras are a numerous race, and call themselves "Ovaherero;" they are tall and well made, and subsist chiefly upon their prodigious herds of cattle; in some cases 8000 belonging to one individual. To the N.E. dwell a people called Ovatjoane, akin to negroes, and to the north a people called "Ovampo." Their country is very fertile, and they live in towns and villages under a king, and practise agriculture. The Damaras understand the language of the latter. They are very careless of and cruel to their sick; practise circumcision, and follow the Eastern custom of taking off the sandal. They have a community of wives and also of goods—the Socialists in fact of S. Africa.

It has been again and again stated that the river Coanza takes

its rise in a lake. That able geographer, De Lisle, has a lake in about 15° S. lat. ; and Viscount Bandeira confirms this in a letter which I received from him some years ago. He states that a Portuguese gentleman, who had been in that portion of Africa, informed him that there was more than one lake furnishing supplies to that well known stream ; and he adds that he knew of no direct communication from Southern Benguela through the interior to Tete.

The rivers descending from the N.W. and the W. to the lake, coming, as they certainly do, from snow-clad mountains, prove first that, from their swollen state and great coldness, their respective courses must be short ; and secondly, preclude the possibility of the Zouga having any connection with the *Cuama*.

There is something unsatisfactory respecting the river Luaba and its connection with the river of Quillimane, and also the Zambezi. Starting at once from the river Quillimane, only a few yards broad, the Luaba is entered, a mighty stream about one mile broad, with a rapid current. We hear little or nothing more about it, and then find the Zambezi at Tete, while from Lacerda we learn that where the Zambezi passes through the Great Lupata chain, or, as it is called, "the *Spine of the World*," the stream, though doubtless very rapid, was yet so shallow that it would not admit the navigation of very light boats, which compelled Lacerda to travel by land until he got beyond the dreary passage. Can the Luaba be a stream coming from the S.W., and joined by the Zambezi below Sena ?*

It is remarkable that the generality of the tribes in this portion of Southern and Eastern Africa have traditions concerning the Flood, the Fall of Man, and his Expulsion from Paradise. One tribe, dwelling in the mountainous region to the W. of Séna, relate of the Creation and Fall of Man almost exactly the same as we do, but with the following addition—that the Deity placed a covered pot at the foot of the tree of knowledge, with the strictest injunctions not to open it. This was to be the test of their obedience or disobedience. After much doubt and delay, curiosity on the part of the woman got the better of her faith ; she accordingly opened it, when out sprang a rat, which sprang up the tree and ate the sacred fruit. The Deity, for this act of disobedience, expelled them from the Garden, and doomed them to wander into distant lands, and their children to be "*black and stupid*." They accordingly came into the land of the blacks (Africa), where a son and a daughter were born unto them, both black and ugly, which so horrified and disgusted them that they fled from their offspring into the land of the whites, where repenting, the Deity became reconciled to them, and blessed them with happiness, prosperity, and children.

* See Note at p. 251.

Quitting this portion of Africa, let us turn to the parts W. of Mombas, to the Great Lake in the interior, about 500 geographical miles distant, and the countries and rivers S. of Kaffa to the Bay of Formosa and Melinda. Besides the interesting communications of Messrs. Rebmann and Krapf, numerous Arabic, Portuguese, and other authorities have been carefully examined. Rabbai M'pia, where these worthy missionaries are stationed, is situated on a ridge of mountains about 25 miles W.N.W. of Mombas. This ridge runs in a N.E. direction, and terminates on the sea-coast close to the point where the river of Killeef was placed in our maps, but which Dr. Krapf ascertained not to be a river, but an arm of the sea extending inland among high mountains to a distance of 25 miles. The air of these mountains is cool and the climate excellent. Mr. Rebmann's first journey extended only to Taita, but his second was carried out to Jagga in its S.W. extremity. Crossing the ridge from Rabbai M'pia, he came, after 30 miles journeying, to the edge of a plain or desert near Endanga. From this place he crossed a plain covered with thorny bushes and with little water, until at the end of 8 days (about 73 miles) he came to Kadiaro, the town of the chief of a portion of the Taita tribes, situated on the S.E. end and side of the range of mountains. These rise abruptly from the plain to a great height. Kadiaro is about 4000 feet above the level of the sea, the climate cool and delightful—every spot cultivated, the sugar cane abundant, and sheep and goats are numerous. The peak of Kadiaro rises to a height of about 2000 feet above that place. The first range runs from S. to N., with numerous springs and many small lakes. The Taita country consists of three great ranges of hills, with many hundreds of villages, and about 150,000 to 160,000 inhabitants. The first range from Kadiaro W. is about 5 miles distant, and is called Lahenga Mahasson; and the third or western range is about 15 miles to the W., or rather to the N. of Kadiaro. The country is divided into three districts, viz., Kadiaro, Endara, and Boora, or Kelim Kobema, the last two districts stretching from S.W. to N.E., about three days journey. On the plain, near the E. side of the Kadiaro range, were found numerous detached rocks, some of them 100 feet high. Mr. Rebmann was well received by the people of Kadiaro.

The Taita mountains stretch northerly to a distance of 40 or 50 miles, where they join a lower range, which passes E.N.E. till it unites with the mountains running to the N.E., immediately behind Mombas, and at the same time with a higher range which runs westward till it joins the snow-covered hills of the W.

In the end of 1847 Mr. Rebmann left Rabbai M'pia to proceed to Jagga, a remarkable country situated to the westward, or rather N.W. by W. of Taita, and on the direct road to the Great

Lake. He pursued the road to Taita, and passing Kiadiaro bent his way to the W.N.W., as he passed through the southern parts of Boora. From Kadiaro to the confines of Jagga is seven or eight days' journey over ridges, and one plain of two days' journey without water. From the Boora district Mr. Rebmann first saw the great mountain of *Kilimandj-aro*, covered with perpetual snow, and then five days' journey to the west. The ridges in this part run from S. to N. He stopped some days at Masagnote, whence Kilimandj-aro is visible. Leaving Masagnote, he crossed the river Gnaro, the receptacle of all the waters of Boora, which river turns to the east and runs to the Pangany, being joined a little to the south by the Madadi, from 3 to 4 yards broad. Two days from the Gnaro he crossed the Lami, 1 foot deep and from 10 to 12 broad. As he approached Jagga the country became fine and covered with trees. Soon after he crossed the Gana, 3 feet deep by 30 to 40 broad, a rapid stream, the water of which was very cold, the stream descending from the eastern side of the snow-clad range. Crossing the river, he entered the kingdom of Kislema. The Gana joins the Lami, and these united form the head waters of the Pangany, or Fangany as the Arabs pronounce it. To the N. was the Kiskambutia mountain, E. of Kilimandj-aro, which former mountain forms the boundary of the Wakamba country. In his next journey Mr. Rebmann proceeded still further W. From Kislema to Mambkunga is 10 miles, at which place the peak of Kilimandj-aro bears N.W. Next day he went to Madjame, where he slept, then about 6 miles from the mountain. Pursuing his journey through a country intersected with valleys from 1500 to 2000 feet deep, he crossed in a day and a half's journey, between Kislema and Madjame, twelve streams, one of which was only 5 inches deep and 5 yards broad. Here, in the province of Uru, or Oroo, the mountain was about 6 miles distant. Eastward, and distant 10 or 12 miles, was *Mount Shuru*, sometimes covered with snow. On the 6th of January, after a journey of 15 miles through a very rugged country, he came to the Weriwarie, 1½ foot deep and 14 yards broad, forming the eastern frontier of the state of Madjame, to the chief of which he was bound. Here Kilimandj-aro was only about 3½ miles distant. The state of Madjame extends three days' journey E. to W., and 10 or 12 miles from S. to N. and is bounded to the N. and N.E. by the snow-clad mountain of Kilimandj-aro, or, 'the Mountain of Greatness.'

Mr. Rebmann clearly intimates that a considerable portion of its height was covered with perpetual snow. In this latitude the line of perpetual congelation is at least 17,000 feet above the level of the sea, so that its height probably exceeds 20,000 feet. Many streams descend from the snow (called *Kibo* in the language of Jagga) to the W., in which direction, and at no great distance,

there is in the country of Handu or Hendrui a lake called *Ro*, which in the rainy season and from the melting of the snow becomes very large, when the surf on its shores is very rough. During the dry season it almost vanishes, and the land around its banks becomes encrusted with salt, which forms a considerable article of commerce for the natives with the neighbouring tribes. It is in a country called *Djado* or *Jajo*, from which Kilimandj-aro is still visible. From salt being found on its shores it is clear that it has no outlet, nor can it be the source of any fresh water river, though it is certainly the receptacle of one, and probably that one which rises near the equator to the south of the sources of the western branch of the Nile. The streams descending from Kilimandj-aro run to the S., and from its northern side others descend to the N. and N.E.

This mountain is about 180 geographical miles nearly W. or W. by N. $\frac{1}{4}$ N. from Mombas, and consequently in about $36^{\circ} 38'$ E. long., and $3^{\circ} 20'$ S. lat. The northern extremity of the Taita hills rise to a great height, and next in height to Kilimandj-aro, and 12 miles N.E. is Mount Shuru (the Djulu of Krapf), but without perpetual snow. The cold upon the Taita hills is, however, very severe, as was found by a party from Mombas, who, going to invade some of the Jagga tribes situated beyond them, were compelled to retreat, and being attacked by the people on the summit of this range, were routed, the cold being so intense that their benumbed hands could not use their fire-arms.

Near, and to the N.W. of Kilimandj-aro is another lake called *Lucajo*, formed by the melting of the snow; and not far from the lake, N. to N.W., is the tribe of Wabehkimo, literally, 'the small race,' their stature being only twice the length of the arm from the elbow to the tip of the middle finger. Beyond the chain, of which Kilimandj-aro is the chief, is the powerful tribe of Wakamba and more to the W. a portion of the Ukuafi.

The Wakamba live around the river *Adi*, which is not passable during the rains. The Ukuafi are a wild fierce people, who have neither houses nor huts, and subsist upon milk and meat. They dwell near a river, which is so large that they cannot cross it; and the western portion of the tribe make frequent attempts to cut off the communication of the Wakambas with Jagga. They do not bury their dead, but throw them away, to decay or to be devoured by wild beasts. The great river mentioned is no doubt the Sabake, hitherto considered as the Quillimancy.

Mr. Rebmann gives a route from Madjame, by Wanderebo and Uniambe to Ugago or Ugogo, of twelve days' journey, which latter country is next to and near the Monomoises, a people, not a place, and which name he says comprehends an immense track of Central Africa. From the eastern borders of their country it is fifteen days' journey to the lake, through a nearly level country. Dr.

Krapf says, that from Jagga to the lake is from 150 to 200 hours' travel. Hours is an Arab mode of computation, and each hour is equal to about $1\frac{1}{2}$ or $1\frac{3}{4}$ geographical miles, and taking the medium, 175 hours is 300 miles, which is rather more than can be accomplished by common caravans in thirty days' journey; but computing it at 165 hours, it would, when compared with other more specific accounts, be tolerably correct. The capital of the Monomoises is called Usambara, and its powerful chief Libun. From Usambara is probably derived the well-known name and lake Zambre.

Dr. Krapf gives many interesting particulars of eastern Africa in general, and of that portion of it situated between Mombas and the Pangany river, which he had visited by land, and also by sea along the coast. To the N. of the Pangany the country is hilly and rugged in the extreme; the mountains rising in some places to the height of 6000 feet above the level of the sea, steep and rugged with narrow fertile valleys. The most important portion of this hilly country is called Usambara, and the capital is about three days' journey from the mouth of the Pangany. The coast to the N. of Pangany is bold and rugged, and bears the strongest marks of having, in early times, been torn by terrible convulsions of nature. The Pangany Dr. Krapf found to be about 150 yards broad; a deep and rapid stream descending from the mountainous country just alluded to. Its mouth is in $5^{\circ} 30' S$. The town or village of Pangany is on the N., and the town Boannee on the S. bank. From this last mentioned place the caravans start to proceed to the great interior lake to the W.; the first part of the journey bending a little southerly to avoid the precipitous hills through which the Pangany flows. This is important to know, because the starting point has hitherto been stated, although from this town, to be on the coast almost S.W. of Zanzibar, which, if considered to be the starting point, would make a serious difference in the position of the lake. What Dr. Krapf states is confirmed to me by other authorities, and especially by an itinerary which I presented in 1845 to this Society, and which is one of the most correct that ever came in my way. According to this the distance from the sea to the lake is sixty-two days' actual travelling, and Prince Hillwal, the son of the Inaum of Muscat, who was in this country a few years ago, confirmed this statement. Dr. Krapf was told repeatedly that it was sixty days' or two months west from Mombas, and in the country of Usambara he met a man who had been at it, and said that from Usambara the distance was fifty days' journey, the road lying through different tribes, the names of several corresponding with those given by different authorities, more especially by one transmitted to the United States by the American consul at Zanzibar, and published some years ago in those States.

The position of this lake should therefore be in about $4^{\circ} 30'$ S. lat., and 31° to 32° E. long.; but allowing 8 geographical miles for the day's journey, which I think may properly be done, the true position will be in 31° E. long. The route from Jagga passes more to the N. than the route from Boannee. Where the latter reaches it towards its southern extremity it is described to be in breadth equal to the distance from Zanzibar by sea to the African coast, or about 24 miles; but it appears that it spreads out greatly to the N.W., though I suspect its reported breadth in that part arises from the expansion of the river coming from the N.W., as travellers say there are numerous islands in it, on one of which they rested each night as they proceeded through it, during the space of eight days. Two Portuguese missionaries, who had reached it from the S., state that two large rivers run into it from the W., by which they conceived the Portuguese from the E. coast might reach their possessions in Benguela and Angola. It goes by different names, Taganika, Zarahwah, and Bahar Safe,* the latter name heard by Dr. Krapf, being probably a corruption of the name Luffia or Roofoo, *the great river which runs through it*. The land is very flat on both sides of the lake, especially for nearly fifteen days' journey to the E. of it. Dr. Krapf heard the customary African reports, that while one river flowed from it to the Indian Ocean, another ran from it to the W. or N.W.; which latter he considered might be the Congo, by which he thought he could, in the journey he contemplated across the continent, reach the Atlantic.

We have had so much experience of this mode of reversing the course of rivers by native Africans, that we can have no difficulty in seeing the error. The river running from the lake in the direction of the Congo is in reality a river flowing from the centre of Africa into the lake. Dr. Krapf heard of the great river "Roofoo" in the interior, abounding with islands. In this we recognise the Luffia (the letters L and R being readily changed in Africa), which is the Rofoe crossed, in $3^{\circ} 22'$ S. lat., and $26^{\circ} 18'$ E. long., by Pedro, the Portuguese traveller, whose routes through the central parts of the continent are generally accurate and interesting. Dr. Krapf had also heard of a great river, that from the interior (700 miles from Mombas) ran to the Western Ocean; which is probably the Coango in its early course. He also maintains that white men came from the W. coast to the great lake.

One nation deserves particular mention, namely, the Wakamba, a great people (not negroes), who spread from the N. of Kilimandjaro along a great river northwards to the parent stream of the Ozee. These Wakambas hold communication with the Goida negroes,

* Lake N'yassi is fifteen days' journey (say 150 miles) due W. of Quiloa.

and, first crossing a great river (the Dana?), travel up a river (the Maro, or Pokomoni?) northwards till they reach the country where Christians are found (Kaffa and Enarea), from which people in the dress and of the colour of Arabs come to trade. Immediately beyond the Wakamba, to the N.E., are the Gallas, who, though a superior race of men, are from their warlike habits the scourge of Eastern Africa. Some of the Wakambas are, as Dr. Krapf was told, very fair, and Bruce has stated the same. That there are white people in the interior of Africa has often been asserted. Prince Hillwal assured me that they were now but a small community, and that their place of residence in the interior was about 15 days' journey from the western boundary of his father's territory; they lived on a mountain near a river, carefully guarded, especially during the night, when the gates were shut and secured. Whence have they come?

Dr. Krapf states that the country to the N. of the Taita range becomes open, and that villages beyond it can be seen to a great distance. At a month's journey in that direction is a country (Ukumbani?) surrounded by a river, to which people from the N., in the Arabic dress, and speaking the Arabic language, come after a journey of two months to trade. This indefatigable missionary visited every part of the Bay of Formosa, and the mouths of the rivers to Patta and Lamoo. He says all these rivers join in the Delta, and come from two great streams; one descending from the unknown countries of the W., and the other, the Ozee, from one great river flowing from the N.W., but communicating not far from the coast with the western stream. He found the Ozee ebb and narrow at its mouth (a proof that it shifts from the floods and the surfs), but inland it is very deep. It comes from the great river called Pokomoni, from the name of a tribe and a great chief on its banks. It is identical with Captain Owen's Pokemasa. The Gallas call this river the Maro, and the Sowaheles call it the Yamba. On the upper part of the Maro there is a tribe called Kaffiro, who are very fair, and who bring down Arabian articles for sale. These names may be recognised as the Maro or Malo of Sir William Harris and others, and the Yamba of Mr. d'Abaddie, who maintains, as I think, the erroneous opinion that the Gojob joins the White Nile in the country of Yamba. It is the great river of the Portuguese called "Obû," a corruption of the name "Omoo," by which it is known in its early course. Dr. Krapf heard the customary African stories about the Gojob, the Jub, the Ozee, the Pokomoni, Pangany, and Luffia, &c., being the same river, or coming from the same river, which communicated with the White Nile; all of which reports mean simply that these rivers take their rise nearly in the same high districts of Central Africa.

When once over the bar, the Ozee, or Pokomoni, becomes broad, and deep enough for large ships. I am informed that, at the distance of about 60 miles from the sea, it is joined by a large river from the N.W. Dr. Krapf says the Pokomonis understand the Galla language, and supply the great Gallas with rice, maize, &c. He also gives the names of many considerable Pokomoni towns, extending along the banks of the river to a distance of 12 days' journey. At Killangore, one of these, Musa, a great Pokomoni chief, has his residence. He is frequently attacked by the Gallas, and also by a portion of the Ukuafi tribe, residing near him. Two other divisions of this barbarous people dwell, one to the N. of Taita, and the other to the N. or N.N.W. of Jagga. A native told him that the entrance to the middle branch of the Pokomoni, at or near Emtotama, resembled the entrance into Surat, where he had been. The natives do not row their boats on the Pokomoni on account of the rapidity of the stream, but move them by means of poles, which they strike into the banks. There are no dangerous fevers around these rivers, and Dr. Krapf was told that the climate was generally healthy.

The length and size of African rivers are not to be judged by their outlets, because in almost every portion of that continent they are blocked up with bars of sand and stones thrown up by the joint action of the river and the ocean. Through and in these banks of stones, sand, and gravel, the water of the rivers sinks underground, as it were, and finds an outlet. Many African rivers flow through vast table lands, where they not only receive few affluents, but where the evaporation of a tropical climate diminishes in a great measure their volume; hence the discrepancy between their magnitude in the interior and their outlet into the ocean. This is particularly the case with the rivers on the eastern and south-western coast.

Dr. Krapf describes with great feeling the ruins of the ancient town of Melinda, situated near the bank of the river, and at a short distance from the bay and De Gama's pillar. It must, at one time, have been a very important place. Many of the houses stand yet in streets of great length, but the doors and windows are all gone, the walls going rapidly to decay, and becoming covered with bushes. The water, to the edge of which had been a wharf of great extent, was 30 feet deep. It had been ruined by the Gallas and other savage tribes after the decline of the Arab and Portuguese power. The river at this place is either the Sabake or a branch of it, that is, the river (Gelana Sabake) which comes from the W. to join the Pokomoni or Ozee (Gelana being the Galla word for river, or river of the woods or desert). In extracts from Torre Tombo, or the public records of Portugal, it is stated, that in the days of their African strength the Portu-

guese navigated this river to a distance of 17 days' journey. This is the river which has been called Quillimancy, but Dr. Krapf says that there is no such name to any of the rivers in the bay of Formosa, but that the error has arisen from the Arabic word Keomancy, Kilima-dá Mansi according to Rebmann, the name of a great coral reef, which extends itself opposite the mouth of one of the branches entering the bay of Formosa. This river, I consider, comes from, or is formed by, those streams which rise in the centre of Africa about the equator, and to the S. of the sources of the eastern branch of the White Nile.

Besides the river Sabake, Dr. Krapf mentions smaller streams which descend in a north-easterly direction from the boundary of the Taita range, and especially one, called the Karanghe, or rather Tzavo, which comes from the great chain to the N. of Kilimandj-aro. He also states that there is a fine harbour about 40 miles to the S. of the mouth of the Jub, called Keeama, but the entrance has too little water for vessels of large burthen. He speaks in raptures of the excellence of the climate in those parts, especially about Tanga and the Pangany.

Much time has been wasted by parties anxious to prove the Gojob of Kaffa to be the parent stream of the White Nile; and though Bruce adopts this theory, on the other hand he tells us* that he was informed by excellent authority at Gondar that the Kibbee of Kaffa (certainly the Gojob) bent its course to the S. and S.E., and entered the Indian Ocean near Melinda. That it did so was no doubt one of the reasons, perhaps the main reason, why Fernandez and his companions were sent from Abyssinia by Enarea that way to the sea and the Portuguese settlement at Melinda, in order to have water conveyance a part of the way. The distance from the capital of Enarea to Melinda was then estimated at 35 days' journey. In the map accompanying the quarto edition of Bruce's Travels, we find the course of the Kibbee so laid down, and issuing from the sources as stated by Mr. d'Abaddie. It is denominated the Zebee or Quillimancy in the map alluded to, while the Jub, a separate river, is called the Aeco, famous in the Abyssinian wars of the African Mahomedans.

In the sketch map which accompanied this paper the extreme sources of the eastern branches of the White Nile were laid down in $0^{\circ} 30'$ N. lat. and $34^{\circ} 30'$ E. long. The first Egyptian expedition (1839-1840) left this river, in $3^{\circ} 22'$ N. lat. and $31^{\circ} 45'$ E. long., descending from the S.E., and said to be from a lake. This branch was then (27th January) 1390 feet broad, about 3 feet deep, and subsiding fast from the effects of the dry season. Since this paper was written, Dr. Krapf has visited England.

* Vol. iii. p. 331, 8vo. edition.

Besides his Journal, I have had personal communication with him regarding his late journey from Mombas to Kitui, the capital of Ukambani. This place is in nearly 1° S. lat. and 37° E. long. The high snow-capped mountain, "Kænia," bore about N.W. by W., the distance about 105 geographical miles, the mountain thus being in $35^{\circ} 20'$ E. long. and $0^{\circ} 20'$ S. lat. From the N.E. portion of this mountain runs the river Dana or Daena, a great tributary of the Ozee or Pokomoni, and other rivers, that enter the sea in the bay of Formosa. The Dana, about 50 miles W.N.W. of Kitui, is, during the dry season, 200 yards broad, 5 feet deep, and its course to the sea is uninterrupted by rocks or rapids. Dr. Krapf was informed that another river rose to the N. side of Kænia, which ran northwards to the country of the White People (the eastern branch probably of the Bahr-el-Abiad). From this point to the place where the Egyptian expedition left it is about 245 geographical miles, furnishing a space sufficient to feed a river of the magnitude already mentioned.

The river Sabake, in its lower course, is formed by the Adi, the Tzavo, and several other streams. The Adi bounds the Wakamba country on the S., and comes from the country of Kikuyu in the S.W. of Mount Kænia. This river (then the dry season) was 170 yards broad, its banks 25 feet high, but at that time the water in the channel was only 60 yards broad and $1\frac{1}{2}$ feet deep. The Tzavo comes from the N.W. base of Kilimandjaro, and is, where Dr. Krapf crossed it, 24 feet broad and 24 feet deep. The Dana bounds Ukambani on the N., and receives several rivers from the N. and to the E. of Mount Kænia. Farther N. and N.E. of Ukambani the country becomes very hilly, while Ukambani generally is an elevated plateau, dry and healthy. The distance from Kitui to Mount Kænia was given at 6 days' journey, or rather six halting places; and to Kilimandjaro it was stated to be 10 days' journey (according to Dr. Krapf 40 hours). This mountain is visible from Kitui. From the bearing which Dr. Krapf saw Mount Kænia take, namely, from E. to N.W. by W., it is obvious that the two snow-clad peaks, which he saw apparently near each other, would still be at a considerable distance from each other. The mountains extending N. from Mount Kænia we know, from other authorities, are very high, and capped with perpetual snow. Appearing just on the range of the horizon, with no hills intervening, it is obvious that Mount Kænia must be at a considerable distance from Kitui. S.W. from the mountain, and in the country of the Kikuyu, is a high volcano in activity. To the W. of it is a country called Muhame, destitute of wood, but of volcanic character. The people of Ukambani are willing to labour for wages, and seem to be without slaves. They are not negroes. Kivoi, the chief of Ukambani, told Dr. Krapf that he had been to a country N.W. of Jagga, where he saw men with tails. Ivory is very abundant in all the adjacent countries.

Dr. Krapf undertook his journey at the close of the dry season, November. He left Kitui on the 4th of December, immediately after which the rainy season commenced, and he found the river Adi a little swollen in consequence, when he passed it on his return. The tropical rainy seasons are sure guides. The theory that the White Nile rises at a considerable distance to the S. of the equator is, by these unerring laws of nature, quickly disposed of. If it did so rise, then the Egyptian expedition would have found the stream not falling but rising in January, and they were told that the river would not begin to rise till the close of March. On the other hand, all the rivers which flow into the bay of Formosa, flooding in February, prove that their sources are all to the S. of the equator; while the Jub and other streams to the N. flooding in June, July, and August, show that their sources are in high lands near Shoa and in Enareca. Martin of Tyre stated that the Nile of Egypt rose under the equator; the priests of the temple of Minerva in Egypt told

Herodotus the same, when they informed him that one-half of the waters of Africa ran to the N. and the other half to the S.; Bruce also maintained that the farthest source of the White Nile was near the equator.

Dr. Krapf mentions a remarkable feature of the country seen on his journey before coming to Tzavo, namely, a hill or bank about 200 feet high, extending from the mountains near Killeef along N. of the Taita mountains to the W., towards the sources of the Adi and the country of Kikuyu. How is this?

Note to p. 241.

Since this paper was written, an account of the journey of Mr. McCabe, a trader from Grahamstown to these parts, has come into my hands. From the Mooi river (the *Chanopas* of Harris) he went to Magaliesberg on the Ouri river, and from thence, in eight days, he passed the Cachen mountains, and then the Limpopo, where it struggles through the hilly country. Thence he marched 28 miles N.E., the Mural range being then about 18 miles to the eastward. He reached the river Mathabatzé, went down it about 25 miles, then crossed it where it was 20 yards broad, and after a journey of 80 miles (70 geographical), he came to the Umgoolah or Mikolwe (called also the Tlatla), crossed it where it was 80 yards broad, and travelled 35 miles down its right bank to its junction with the Limpopo; say in all 128 geographical miles N. from the passage of the Limpopo in nearly 25° S. lat. Thence he proceeded (by compass it is presumed) E.N.E. to the Pallallah or Liphallala, a broad, clear, and rapid stream. Continuing his course 130 miles (110 geographical), he crossed the Limpopo, 200 yards broad, and running deep. During the first day's march he came to a small tributary, up which he travelled to the close of the day N.W. He then struck off to the N., and on the third day came to the small river *Rakwi*, which joins the Maclooueste to the eastward. His guides then took him in one day to the river Maclooueste (the *Motuiste* of Oswell), which he found to be a fine stream 150 yards broad, and running E.N.E. (descending it one day) parallel to the Limpopo, which it joins at a considerable distance to the eastward. This is no doubt the river called Zougá, near to Lake Ngami. On the *Rakwi* he found the tract of Potgeiter's party, who marched that way to attack Moselekatzé, dwelling to the N. of the Limpopo, from the *Zantpansberg* (salt-pan hill) situated to the S. of the Limpopo, where this boer chieftain had fixed his residence about 18 years ago. In the lower part of his journey Mr. McCabe was obliged occasionally to quit the bank of the river owing to the hilly rugged nature of the country. On the S. side, and somewhere near its junction with the Maclooueste, the Limpopo is joined by the Malaquiane (mentioned by Oswell), a very considerable stream which comes from the Mural chain, or, as it is so called by the boers, the Waterberg Mountains, or rather from a range which branches off from them E.N.E., called the *Blauenberg*, joined, it is supposed, to the salt-pan hill.

Mr. McCabe has therefore been farther down the Limpopo than any other traveller. He is more clear in his descriptions and course than either Oswell or Cumming, but agrees with them on all the main points where their respective journeys coincide. The direction they and he travelled was E.N.E. in their general course down the river, which, considering the bearing to be by compass, and the variation in these parts last year, 26° W. would carry the course of the Limpopo at Mr. McCabe's farthest point E. (its first great eastern turn being in 22° 46' S. lat.) to 23° 10' S. lat., and nearly in 31° E. long., considering Mosega to be in 25° 36' S. lat., and 25° 52' E. long. He states that, at the point where he left it, the Limpopo bent its course more to the E., and the others, from the reports, give it an E.N.N. direction, with very high hills on its southern banks.

By accounts just received from Mr. Livingston, Lake Ngami is the receptacle of the waters from a *larger lake*, about 150 geographical miles to the northward, which contains several islands, on one of which Sebatoane resides. A rapid river, called the Teoge, connects the two, and during the rains this river rolls down large trees and the carcases of animals. The shores of Lake Ngami are dreadfully unhealthy; the prevailing fever resembling the yellow fever of the West Indies. The inhabitants on the shores of the lake have some knowledge of the Portuguese on the W. coast.

XVII.—*On the Northern Frontier of Nepaul.* From a Member of the Nepaulese Embassy in London. Communicated through the President.

(Read June 10, 1850.)

THE latest editions of maps of India, including those of Keith Johnston, Arrowsmith, and Ritter, agree in their delineation of the northern frontier of Nepaul. This boundary is incorrectly laid down, and should be moved further N., so that the line should leave the boundary (at present laid down) at Gosaenthan; from which place, westwards, both slopes of the main line of snowy peaks of the Himālaya belong to the Nepaulese. The boundary then runs along a ridge to the N. of the Himālaya, including Mustang. This place is about 30 miles from the foot of Dhawala-giri, and is much resorted to by pilgrims. From Mustang the line should be continued westwards so as to include the valley of Humla, containing the head waters of the Ghagra which traverses the western portion of Nepaul.

F. Hamilton Buchanan, who was in Nepaul in 1802, says, (p. 272) that "the river Gandaki, rising near a place called Damodur Kund, runs through the territories of a Bhotan chief, called the Mustang Raja, who is, or at least when I saw him in 1802 was tributary to Gürkha; but there is reason to think that since that time the Chinese have compelled the Raja of Gürkha to cede both Mustang and Kurung."

The district Humla is laid down in Ritter's map as Yumila; besides there is Jumla, in which is the town Dipal (Yumila and Jumla are the same name, as are Yamuna and Jumna). But are Humla and Jumla distinct, or are they names of the same river-course, pronounced differently in different districts of the Himālaya?

The distance from the Nepaulese and the Tibetan frontier to the Brahmapootra is about 7 kos, or 14 miles. At the place designated, the river is about as wide as the Thames at London, and fordable in some places.*

* For Dr. Gutzlaff's account of the Nepaulese frontier, see pp. 194-199 and 211.—Ed.

Route from Katmandu to Mustang.

Day's March.	To	Miles.	Remarks.
1st	Dhurruntally . . .	8	
2nd	Nūakit	10	
3rd	Samuri	10	Ascent.
4th	Churmgay	10	Ditto.
5th	Sullen	12	
6th	Gūrkhā	12	
7th	. . . . .	12	
8th	Tunhong	12	
9th	Simbulchur	20	On a river.
10th	Syaldara	14	Slight ascent.
11th	Deorallé	18	
12th	Pohkura	18	{ In the valley are three lakes, 7, 9, and 5 miles round.
13th	Kaski	14	
14th	Madi	10	In the mountains.
15th	Gūringia-Kolah . .	14	On river so called.
16th	Ullehri	16	
17th	Chittrīa-Atiāro . .	8	In the mountains.
18th	Siklis	12	Ditto.
19th	Ghāns	20	Half way to the bottom.
			On the river Kali.
20th	Thāk	8	{ At the foot of Dhawala-giri. Snow on both sides to Mus- tang.
21st	Pānch-gong	10	
22nd	Muktināth	12	{ Half way up the mountain.— Hot springs and bituminous fires.
23rd	. . . . .	18	
24th	. . . . .	12	
25th	. . . . .	12	
26th	. . . . .	10	
27th	Mustang	14	{ A horseman can travel from Mustang to the Dsangbo river. The Tibetan boundary is close to Gūmha, which is in Tibet.
28th	Gūmha	14	
		360	
	The Brahmapootra	4	

NOTE.—Mr. R. Strachey thinks Mustang to be similarly situated to Milam, or Niti; both of which are considerably to the N. of the great snowy peaks in their vicinity. The watershed of the chain, which forms the actual boundary between Tibet and the British Himālayan provinces, is a truly natural frontier, following a line of twenty or thirty miles more to the N. than the line of the great snowy peaks, and the same will probably hold good in Nepaul.—Ed.

XVIII.—*The Kubbabîsh Arabs between Dongola and Kordofan.*
By MANSFIELD PARKYNS, Esq.

(Read June 10, 1850.)

THE travels in Kordofan by M. Pallme, in many parts erroneous, are more especially so in the 7th chapter, entitled '*Kubbabîsh*.' I had his work with me on the spot, and, remaining a long time in the most intimate acquaintance with this tribe, I am able to ensure, in a great measure, the correctness of the alterations made by me in his statements.

The Kubbabîsh date their origin from the Howàra, a tribe of Upper Egypt, said to be of Mòghrebîn extraction, and who fled from Tunis, being driven thence by Abou Zeyd-al-Hellaly. The Kubbabîsh is the largest tribe of *camel** Arabs that inhabit the W. side of the dominions of the Viceroy of Egypt. They extend from the Hafir, nearly two days' journey below New Dongola, to Zerayga, and from the vicinity of lake Shad to near Düem, on the W. side of the Bahr-el-Abiad. On the E. bank is another race of Arabs, called Hassanfyah. They may be taken in three divisions:—1. The tribes that remain all the year in the desert, only sending persons occasionally to the Amâr (or regularly inhabited tracts, such as Kordofan or the banks of the river) to buy corn and pay their tribute. These go westward for the rains with the rest, but instead of returning to the Amâr with their companions for the dry season remain either at Sahfy or Buggarîa, or the wells of Abou Sebîb or Abou Senaÿt, or near Jebel Abu Hadîd. These are the Howàra, Dar Saïd, and Lahamdy. They formerly descended to the river with the others, but the government called on them to remain in these parts as a protection to travellers against the incursions of the Darfûr Arabs, especially the Beni Jerâr, who continually made descents in bodies of from 200 to 300 men, mounted on camels, and plundered the caravans between Kordofan and Dongola. The desert is now continually watched by scouts mounted on dromedaries and horses, who follow the traces of these Darfûr Arabs, the government having given them the right of attacking any hostile tribes that may appear in this desert, a fourth part of the plunder being given up to the diwan or government treasury. The road has been perfectly safe since this regulation, which was made in consequence of the plundering of Mustafa Pasha's caravan three years ago. Since this only a few attacks have been made on parties of Arabs that have straggled from their companions, which have been repulsed with loss to the aggressors. The Kubbabîsh have usually horsemen protected with chain armour, at least one or two in each family, besides other horsemen armed

* Arabs using camels in contradistinction to those having oxen.

only with a shield,—one of whom considers himself equal to ten men on foot. The Jerâry cannot bring their horses with them for want of water, excepting during the rains, and then they rarely make a descent, as the Kubbabîsh are too numerous in their neighbourhood, and camel-men must fight on foot, the camel being too clumsy an animal to manœuvre in combat.—2. The tribes which reside during the dry season on the river or other cultivated parts, passing only the rainy season in the desert. These are fifteen in number. The Nurab (tribe of the family of the great chief Wad* Salem), Jeheyne, Ko-ahly, and Battahîn, from the neighbourhood of Shigayg; the Owaida from Kadjmar; the Wullad On and Wullad Howal from Jebbra; the Rowahly at Dasiry, N.; the Seyrajab from Um Gunatér at Abu Hajar; at Kurrery are the Attowiya, Ayayst, and 'Ghalayan; the Hamadab from Dongola; the Shenâbla from near Shad and Düem on White River at Zereyga; and the 'Ghazai. Of these the strongest continue their rain season (Kharîf) westward for four months, passing the Wady-al-Melk (a torrent which comes from Darfur during the rains, and after various windings, amongst which it passes al Ain and Buggarîa, and falls into the Nile at Dubba), while the weaker ones, three in number, Wallâd Howâl, Sayrajab, and 'Galayan, await the return of the others in the desert E. of the Wady.—3. The tribes which may almost be called stationary. They possess but few camels, their villages are stationary, and, though they never build mud-houses like the people of the towns, some of them construct huts (tùkoly) of straw, instead of the tents (khaysh). They send their cattle with the young men to feed in the desert, but never more than a day's journey from their houses, while the old men, children, and slaves, remain at home and cultivate the ground. They are in all fourteen tribes, of which eight are from the neighbourhood of Dongola; the Howawîr, at Ambukôl; Umutto, at Golid; Gûngwonab, at Khundy; Mereysasab, at Sababa; Dar Hâmid (Wullâd el Mermi), at Kabtoll, near New Dongola; Abdallab, at Argo; Sowagab, at Haffir; Gehniyak, at Affât. These have their pasture at the Gab, a portion of the desert between Khundy and Haffir, which extends to one day's journey from the river; they do not cultivate corn but dates, and collect salt, which is plentiful there. The remaining six tribes have their villages, and cultivate corn, viz., the Wullâd Suleyman, at the Jilf, near Shendy; while the Wullâd Ohgba, Berâra, Lahaymerab, and Gereyat, occupy Gummur, Jayrîn, Jebbra, and Abu Ashush, in the direction of Kurrery, near Khartûm; and the Wullâd Tarif at Abu Hajar, on the West River.

Such are the tribes of the Kubbabîsh; those of Dongola, with half the Wullâd Howal, are under a Sheikh of these last, named Hâkim, son of the Wolf (Wad-el-Dîb). With the exception

* Arabic words are put in the *dialect* of the country.

of the Howawir, who have a separate chief, the remaining tribes are all governed by "Fādl Allah" Wad Salem. The family of Hākim, while I was among them, had fled to the frontiers of Kordofan, from the oppression of a former governor of Dongola. I received from them many proofs of friendship, and one of his brothers accompanied me to Dongola, when I presented him to my friend Mūsā Bey, lately become governor of the province, who received him very well, and expressed his pleasure at his return, promising to render his situation agreeable, and to restore to Hākim and his family the chieftainship and all the former privileges and rights which they had lost by their flight. They will probably return during or after the next rains. This tribe (or rather half tribe, for the Wullad Howāl are divided into Dar Mahmūd, who are with "Fādl Allah," and Dar Hāmid, our friends) was formerly privileged as guides, no guide being allowed to be received but from among them. They were all couriers, carrying despatches, &c., between Dongola and El Obeid. I hope, on my return, to find them settled on the river in all their former rights. Of all the tribes of the Kubbabish the Nūrab are the wealthiest. In camels alone they could probably show 2500 to 3000. The rest of the Kubbabish altogether could muster, perhaps, 12,000 to 15,000. As the stationary tribes count but very few, all those of Dongola together could scarcely arrive at 1000, including male and female, old and young. Such is what I have heard; but if I state what I have observed, I should estimate them at more than double that number, the Arabs being afraid to tell the truth on account of the tūlba, or tribute. These camels are nearly all of the *original Kubbāshy* breed; the only breeds which exist in Kordofan are the Kubbāshy and Gharbowy (or western) from Darfur and the western tribes. This latter camel is short and thickset, pretty well adapted for carrying loads in his own country, but little considered by the Kubbabish, who have continually to descend the river, and who have the idea that this race dies soon after drinking river water. For the same reason many Jellaby prefer the Kubbāshy. A great number of the camels in Egypt are of this variety, and are preferred there to the other southern races of lading camels. Hence the Kubbabish buy very few camels, but breed them in great numbers. Besides these, the Kubbabish have large flocks of sheep and goats, and a tolerable quantity of horned cattle.

In strength of men the Kubbabish could perhaps turn out 4000 or 5000 able fighting men, horse and foot. The Nūrab are said to muster near 100 sets of dirra (chain mail) and libūs (padded horse-covering), besides other horse and foot men, for the tribes under Wad Salem, &c., pay a great part of the tūlba, or taxes, in camels. The stationary tribes pay in money, but these tribes are unimportant. The tribes under Wad Salem alone were

taxed 2000 camels, which impost is now changed into the carriage of 4000 loads of gum from al Obeid to Dongola. Last year, besides these, they voluntarily carried 3000 loads for wages. The government pays for each load delivered 80 piastres (16s.); for those which are packed in skins the Arabs receive the whole sum in ready money, while those which the government deliver in baskets only receive 60, the remainder being retained in case of diminution on the road. Besides this the people of Fadl Allah have to pay 100 horses and 2000 dollars of 15 p. each, not taken in money (which would be a great relief to the poor Arabs), but principally in "unless" or choice camels for his highness, Ibrahim Pasha, which are valued by the government at 8 dollars each, while they are worth perhaps 30 to the Arabs. This year alone 100 were taken. The remainder of the tribute is made up in sheep, the Kubbáshy sheep being very large, nearly as high as a young donkey, and worth 2 dollars each at al Obeid; the government generously reckoning three sheep to value that sum. Besides these they pay 50 slaves, or rather their value, reckoned at 30 dollars each. This is taken from Wad Salem's people, and yet these Arabs are considered to be well treated when compared with the people of the villages.

The rains begin in the middle of summer, about June, a most important time, especially for the owners of flocks, as the desert in a short time becomes green, and furnishes abundant food. As soon as water is reported to have fallen in the desert, a dromedary rider is sent to explore and ascertain the truth: if he find no water, or if it be too far, after some days another is despatched, and so on till one brings notice of water at two or three days' distance from the camp. On his return every one strikes his tent, collects his baggage on his camels, and old and young, sick and well, prepare for their departure. Not a soul remains behind, if I except the tribe of Attowíya, who, although they migrate as far as any, and carry houses and all with them, leave their slaves behind to cultivate the earth, in order not to have to buy corn on their return: these slaves build huts, and with them are left the sick and the old. When the camp is raised, the man who has found the water becomes the guide to the kharíf or rains, and goes first with the drums (*nugara*), accompanied by 15 or 20 young men on dromedaries; after them follow the women in their shibariya (a sort of sedan-chair on a camel, a framework of very rough construction covered with common country cloths), the laden camels, and herds of camels, then the horned cattle, and lastly, the sheep and goats. This order is preserved all day; and in the evening, when the guide announces a halt by beating the drum, every one alights from his camel in the position he occupied during the march. Scarcely have they encamped when the guide remounts and starts off to the water to ascertain more exactly the

position it may have assumed since he saw it, and its quantity; for if it be not sufficient for all, the camels can do without water for several days, while the cows, sheep, and goats, cannot stand thirst. Next morning the people start as before, following the tracks of the guide, if he have not returned, until they meet him; towards evening they encamp at about an hour's distance from the water, fearing to go to it that night on account of the confusion which might occur among the thirsty flocks, each anxious to arrive first to the water. During the night the poor men, who have neither horse nor camel, nor dromedary, take possession of a place for their beasts to drink, while the rich await the morning, and start all together in a race, each anxious to select the best watering-place.

Next morning all the flocks are watered; after that an assembly is called by beat of drum, to decide on their future movements, and if more than one tribe be at the same place, to each one is assigned the direction it shall take till it arrive at the Wady al Melk, above mentioned; hither all the tribes descend, those from the White Nile and Kordofan, as well as those from the province of Dongola. Here they remain some 15 days, then send messengers, one tribe to another, to concert movements, &c., and despatch in company a party to Nakhshûs (or el Haymer), a mountain about one day's journey from al Ayn, where they collect salt. The Kubbabîsh, during the rains, or in the dry season, form large troughs of mud near the water, or rather inclose a spot of about 3 or 4 yards in diameter, with low mud walls; this they fill with water, plastering the walls carefully, and put in salt if required, to water their camels and flocks. After collecting the salt, they are obliged to remain a few days to make use of it, and then they start all together. The stronger tribes, and those possessed of a sufficient quantity of "rai" for the return, take the far West, where they remain three or four months. The "rai" are large water-bags of cow's hide, sewn, and of a different form from the "girrab," 8 of which make a camel load, while a camel can only carry a pair of "rai." The Arabs W. of the Nile only use the "rai." After the rains are finished, the water collects in pools "fula," in the low places of the desert, between which the Arabs are obliged to carry water for the flocks. The weaker tribes remain in the desert E. and S. of the Wady al Melk, where they await the return of their comrades. These pass their time in pasturing their cattle, in the chase, and in occasional warfare with the Darfur tribes, who sometimes meet them during the rains. The Arabs of Darfur are the Rizzegat, Maaly, Kimâna, and Hammûr, called Bukkara (cow or ox Arabs), though in reality they also are owners of camels. These inhabit the central part of the kingdom. Besides these are the Habaniya to the S.,

and in the N. are the Attayfat, Bedaiyf, Māhariya, Mahamîd, and Zeyadiya. The last three seek pasture in the northern deserts of their country. The Benî Jerar, ancient enemies of the Kubbabîsh, and former co-inhabitants of the desert between Dongola and Kordofan, are now scattered to the westward, on the frontiers of Darfur. The oldest traditions assert them to have been from all antiquity the sworn foes of the Kubbabîsh, though sometimes a treaty between them allowed them both a short time for peaceful occupations. One rain season, while the Mamelukes were governors at Dongola, the Kubbabîsh, having passed the season in peace with the Jerar, were returning to the river, leaving the Jerar behind in their country near Sahfy, and, suspecting nothing, had left their heavy baggage and their chief behind, and the greater part of the tribes had advanced to prepare their summer station. The Benî Jerar, covetous, like all Arabs, could not resist the temptation of so much unprotected property, and, breaking their faith, killed the chief Mahamîd Wald al Sany, with many others, and possessed themselves of the property and nugàra (drums) of the Kubbabîsh. Before the news arrived the Arabs had dispersed, and it was useless to attempt to revenge their loss during the dry season; so they remained quietly and in preparation till the next rains, when they fell on the Jerar, and after 15 days' pursuit killed their chief Jelleh, spoiling them, and taking three of their nugàra, two of brass and one of wood. The Jerar fled to Darfur, and, going to the other tribes, offered to conduct them to the pillage of a tribe, "pagan and ignorant, but very rich," thus describing the Kubbabîsh. These were deceived and consented, and preparations were made for the expedition. The Kubbabîsh, in the mean time, had passed the dry season, and were again in the far W., when parties detached from them for spying and plunder brought them news of the immense army which, like a hailstorm, was about to fall on them: this news caused a momentary panic in the breasts of the tribe; some proposed to fly, but others, more reasonable and experienced, showed them that if they fled, even to the other shore of the Nile, the enemy, encouraged by their fear, would not fail to pursue them. Others again proposed only to retire a little, in order to obtain time to call the assistance of some of the friendly tribes from Kordofan. This was again overruled by the persuasion that strangers who fought without common interest would be the first to fly and put a fresh panic among the rest; so every one encouraged his neighbour, telling him that he fought not only for his life but for his brethren, wife, children, and property. Only the tribes belonging to Dongola, which, as we have before said, do not advance W. with the others, were called, and these could not arrive in time. The Kubbabîsh were however in a great fright; the cattle

and camels were tied seven days before they saw the enemy, being allowed to eat and drink but little for fear of being pilfered. * Thursday afternoon the enemy pitched their camp about half a mile from the Kubbabish, and next morning came on to the attack.

These Arabs have the habit of commencing hostilities by sending out pilfering parties, who act as spies also. But when one tribe has decided on attacking another, it takes all its property, women, children, cattle, &c., and pitches in sight of the enemy. The cause of this is, because (as the Arabs themselves allow) they cannot fight unless they have this risk under their eyes. The day after the encampment the attacking party descends near the houses of the enemy, who come out to meet it, and each forms in battle array—the infantry with their shields and lances in the front rank, with here and there spaces between them to allow the sortie of the horse, who are behind them; and behind these again are the women, who, by their voices, encourage the men. The battle begins with javelins, then the horsemen pass out and fight in the space between the lines. On these depends almost entirely the fate of the battle, the overpowered party falls back in front of the foot, but after the first sortie never returns behind the infantry; then the battle becomes confused, the infantry of the overpowering party advances, and generally the affair ends in favour of the party whose cavalry gains the first advantage. In general the victors spare none of the men, excepting a few who are flogged until they discover the hidden property. Women and children are spared. On this occasion the Kubbabish, although far inferior in number to their adversaries, had fortune or valour on their side, and were victorious after an obstinate battle, overcoming and pursuing their enemies two days, and entirely despoiling them; since which they have been left tolerably quiet, excepting the affair of Wai.

The Kubbabish hunt principally the giraffe and ostrich, no elephants or buffaloes being found in these parts, but in quantities among the "Bukkara," to the S. of Kordofan. The ostrich is hunted on horses and dromedaries. One day we started from Amry, mounted, five persons on dromedaries: we rode several hours without finding any chase, in the direction of Sitteyr; at last an ostrich was seen in the distance. We rode quietly towards him; but long before our arrival he was off and out of sight. We continued till we had passed the spot where he was first seen, and then, remaining near some bushes as much as possible covered from view, we waited a long time in the utmost impatience. I continually proposed to advance on his track, but the Arabs refused, only replying, "Wait yet a little." At last one pointed him out a little S. of the direction he had taken,

coming zigzag towards us, like a ship beating up against the wind. He approached within some 300 or 400 yards, when, perceiving us, he took off again, and we after him at a swinging trot, but with the hand bearing on the halter. He soon disappeared; and after an hour's run we again paused, when after a long lapse he again returned, but this time flurried, his mouth open and his wings more dangled than before. As soon as he saw us he fled and we after him, but this time at a run. We kept him in sight nearly two hours, and when we perceived that we were gaining on him we started off at a racing pace. I got up first; he made a spirt, but it was his last, for he dropped his wings, and, becoming apparently confused, I soon arrived, and two blows from a light stick on his neck sufficed to throw him down. I was very much pleased at his capture, but cannot say whether I owe my luck to the speed of my dromedary or to the politeness of the Arabs, though I have met with very few camels that could keep up with the one I rode that day.

It would, perhaps, appear from what I have said that the ostrich is hunted only in the rains, but on the contrary the hot season, *i. e.* the dry season, before the rains (about April and May), is the best, for two reasons, namely, because the ostrich cannot resist the heat in running like the camel; and, secondly, because the mud during the rain dirties the feathers. The giraffe I have never had the luck to see hunted, but will relate what the hunters told me. If it be merely to kill a giraffe, a horseman armed with a sharp sword rides after it, and cuts the tendon of the heel. For this the horse must be able to make a good start; for if you cannot come up with the giraffe at the first run, you may as well return to your house, for he will tire the horse, and gain ground at every step. If it be a calf, the horse soon comes up with it, and the rider throws a cord or a cloth, or puts his arm round its neck, and takes it alive, the animal remaining perfectly quiet. They remain in the same spot some days, during which time the calf is fed with the milk of a *nâgah*, or she camel, which accompanies the hunters, till becoming a little tame, and recovering from the fatigue and fright caused by the capture, he is taken to the village. Besides these, the Arabs hunt likewise the antelope, wild cattle, &c. The gazelle is caught near the wells with snares, and in such numbers, that at *Sahfy* the entire flesh of a large gazelle is sold for one piastre, or about 2½*d.*

After the Kubbabish have passed three or four months in the desert they return in the greatest disorder, running as fast as they can, like a routed army. As soon as they arrive in the *Amâr* or cultivated country, they halt among the villages between *Kadjimar* and *Um Gunatîr*. Then they seek their friends and collect together; the tribes next consign their baggage to some trust-

worthy person, probably a fuky, or priest of the village where they may be stopping, and then start for the towns and villages, where they sell anything they may have collected during the rains, such as butter, cattle, or the produce of the chase, and with the money buy corn, which each carries to the place where he intends to pass the dry season. Here they bury the corn, and then return to their baggage, which, with their families, they load on their camels, and carry to the place where the corn was deposited. Wood and straw are then collected for building the "khaysh" or square flat-roofed tent, used during the dry season; while that of the wet season, which is bell-roofed, is called "shügga." Both have a wooden framework: the latter is entirely covered with a large woollen cloth; while the former, being larger, is walled with straw, the cloth serving only for the roof. The camp is built very regularly in lines, with spaces of about 50 paces between each line: the lines run E. and W., facing S., and the flocks are penned between the lines. The chief's house is at the W. end of the central line; that of the "rain guide" is alone, and in front of all. The whole is inclosed with a strong fence of thorns. Each line has openings E. and W. in the outer fence, which are closed with thorns in the evening, after the entry of the cattle. A good house contains a great profusion of furniture, but neither chairs nor tables. The "girrab" are leathern cowhide bags, sewn wide below, and narrow-mouthed, in which is carried the corn. "Jurban" are skins of various sizes, according to the animals to which they belong, usually calf, kid, or gazelle. The animal is flayed by an incision from the rump to each hind foot, and then the skin is drawn over the body and head entire. These serve for all sorts of articles, according to their size, from the little "däbya" kidskin, which is used for tobacco bags, to the calf-skin "jurab," in which is carried flour or cloths. The "mufara" is also a large leathern bag, which in the camp serves as a carpet, and during the journey contains the small "joorban." The "shelil" is a sort of curtain of strips or threads of leather woven together, like a cloth, and ornamented with devices in wudda or cowries. This is hung in the back of the tent. Besides these are two or three pairs of rai, five or six girrab and sayun, for water, milk, &c. These latter are in number according to the inmates of the house. The people of the villages churn their butter by swinging a "saan" to and fro. The Arabs make theirs in the "kambut," which is in shape and size like a broad-bottomed jar, made of "zahf," strips of palm leaf plaited, and waterproof; its neck is narrow, and covered with leather, with thongs to hang it oy. On the road this is filled with milk, and hung on the shibereeya, the motion of the camel sufficing to churn it. During the dry season it is hung on a tripod, and shaken to and fro by a

woman. There are besides three or four buttat or thick leathern jars for butter, suet used for pomatum, and the mesuh or dilka. The "kabota," which is like the "kambut," but much smaller, contains scents, spices, &c. The "afarat" are plumes of ostrich feathers, which, during the journey serve to ornament the head of the camel which carries the shiberfiya, and during the stationary season adorn the house. The master of every house has an "angareb," or couch, of wooden frame, covered with crossed strips of leather. The rest of the family have each a "seryr," or bedstead, and the children divide one among them. When a girl marries she takes one, which is replaced by her father. The "seryr" is made of "jerrid" (date branches), which are tied together in a row; these are placed on pieces of wood driven into the ground.

Ostrich eggs are used for holding scented oils, &c. The Arabs wear shirts; over this is thrown a ferda or cloth, which has a stripe of red or blue, if the owner can afford it; and all who are able wear drawers. I have seen it stated that they only wrap a cloth over their loins: but this is only when they are at work in the wells or travelling on foot. The women wear a large cloth called "jurytain," which is wrapped round the loins, like the "goorbab," and the end covers also the head and shoulders, like the "ferda" of the Dar women, or women of the settlements. They have also a "shimlah," or coarse woollen cloth, which they wear when they smoke themselves, an operation which they perform in the same manner as the town ladies.

Their food during the dry season is nearly the same as that of the people of the villages, with the exception of a greater proportion of milk and meat of the chase in their cookery. During the rains, for four or five months, very few ever touch grain, eating only milk and meat, except when a guest comes; or when food is given as (karama) charity, it is the custom to make a "guddah" of "āsydah," or porridge. The Bukkara Arabs are the healthiest and strongest in all these countries, and their food is almost entirely milk. I have several times lived on milk diet for a long period, and once I was seventeen days, for a trial, without any sort of nutriment, either bread or meat, except camel's milk, of which I drank several gallons every day. I never was better in my life, and all this time I underwent the most violent exercise. I left the place for another, 2 days off, and during the journey was obliged to eat the usual town food, for which I suffered slightly; but on my arrival at Sahfy I returned to milk and to health. Spirits may be good to excite appetite in a man whose habits are sedentary; but the moment I start for my dear desert I forget them entirely, and neither need them, nor could bear the smell of them. How ignorant and stupid are those who exclaim against

the hardships of a desert life ! Nearly all the Arabs chew tobacco mixed with atrum (or ashes which replace the natron). Very few smoke or drink beer, excepting a sort called buggaria, which is not considered unlawful by the Moslem of these countries.

The Arab men eat curds made savoury with "kummun," cummin, or habba sūda, the seed of a sort of fennel, which they reduce to a powder, helba, and onions, from the sayūn; and in the evening a little new milk from the nāgah which have lately brought forth, and whose teats are not yet tied from the young. This milk is very sweet, but only a little is taken from each nāgah. When the young camel, "gand," is tolerably big, *i. e.* about six months old, two of the nāgah's teats are tied with bits of stick for milking, and two left for him; afterwards, to wean him, they are all tied, and sometimes a bunch of thorns is fastened to the udder. The women and children drink the buttermilk from the "kabota." If the man have a horse, he gives it every day a large quantity of camel's milk. The milk of the cows and goats is made into butter. The Kubbabish are hospitable, and strangers, of whom they have no cause to be afraid, are frankly received among them. In their manners they have very little of the cringing of the townspeople, and none at all when in the desert. They, however, when they find themselves on the river, or other uninhabited countries, alone, or separated from their fellows, become rather timid. They talk loudly, and appear always to be quarrelling, and use very strong expressions for the smallest difference; so much so that the townspeople, who are not used to them, can hardly bear them. Every other word of their conversation is an oath, either "may my house be unlawful to me," or "divorce," &c. Their chiefs are not at all feared by them. The great chief alone oppresses them, but this he is enabled to do from his influence with the Turks. The others are respected from their origin or character, and although any Arab would express his opinion with the greatest freedom in the presence of the chief, no one would infringe the little points of etiquette established by their ancestors, such as to sit in a higher or equal post, to dress better, &c. Even the children have little respect for their parents, compared with other races. A lad will sit before his parents in an assembly, and express his opinion with all liberty, and, if it differ from theirs, will sustain it, returning word for word.

In most of the tribes morality is at rather a low ebb, while in some few, such as the Wullād Howal (Dar Hamid) it is very rigorously professed, and in some cases in reality sustained. In this tribe they have a superstition that if a man enters his house after an unlawful amour, some member of his family will die; or if he go among the cattle some animal will die. This serves at any rate to keep infringement secret, for if it were known that a

man had been guilty of such act, even if no mortality ensued, of course all his relations who lived with him would reproach him for risking the life of one of them. These Arabs are hospitable, and a stranger enemy, who may have sought their hospitality, is not only protected while among them, but even, when leaving them, is accompanied by the master of the house, where he lodged, till he is safely out of their district. Even if he be met on the road, a good (that is, well-instructed) Arab would salute him, even if there is blood between them, and advise him not to journey in the direction of his tribe, lest some botheaded or stupid boy should kill him. If a man have blood against another he would seek it in the man's own place, and not take it from him whilst he was a stranger. In all ages they have been respected as generally honest, and never has an instance of robbery by open force occurred among them. Once I lost a small knife with a silver-mounted handle at Um Gunatir. Suspicion fell on the guide who had accompanied us from Shigayg, and had left us the night before we had become aware of the loss. As we had no proofs and the man was already a long way off, we gave up the affair, and in conversation afterwards with the Kubbabish, as a proof of the existence of theft among them (which they denied) I adduced this fact; they, however, never allowed it, persisting always that no one but a slave would be guilty of such an act among them. The smallest object found among them would be declared and restored to its owner: to this rule there may be some exceptions, but as regards camels, horses, cattle, &c., there is no question. If a camel, sick or fatigued, be left on the road (*vide* Pallme, page 134), no Arab, finding it, will kill it, unless authorized by the owner. Many persons of different tribes have assured me, without hesitation or difference of opinion, that among all the Kubbabish to kill a found animal would be equivalent to open robbery, for if the owner had not left it with the hope of finding it again he would probably have killed it himself, for its skin, if not for the meat. On finding a stray animal, if it be weakly the finder gives it a little water, and then, if it be able to walk, drives it to the nearest water; and if returning home, or not going a long journey, takes it home with him. If the animal cannot rise, after giving it water, he leaves it, recommending it to the mercy of God. If it survive it remains with its new master till claimed, and even if unclaimed for many years, there is no danger of his selling it or giving it away. If a "nagah," the finder scrupulously counts to her owner the value of her wool and milk since he has had her, and produces her young if there be any. The hair and milk belong to the finder, and, if the owner be at all generous, a portion of the young also. If it be a camel, the finder may ride or load it with his own effects, but has no right to separate it from his own herds, or load it for hire. If,

after a residence of some time with the herds of the finder, the found camel be on the point of death, the finder may kill it for food after calling witnesses to certify the state of its health. Some sell the flesh, but a very conscientious man would distribute it gratis as charity; but even though he sell it, no Arab who had found an animal would on any account taste of this flesh himself. If it be a female, after her death no one can claim her offspring; as, in order to recognise it, a man must bring witnesses that the camel in question is his, and must show his marks, &c., which he could not do by a hearsay description after the animal's death. Among the Kubbabish males and females are both circumcised, as in Kordofan, Dongola, Sennaar, &c.; the females in the same manner as in the other parts, but without any festivity in particular. After his birth, little attention is paid to a boy, excepting by his mother, till he is circumcised, when, if he be a little grown, begin the occupations of man, such as pasturing, &c.; although this is very uncertain, as there is no fixed period for the operation, some children being circumcised while yet at the breast, and others not till they arrive near the age of puberty. The day being fixed, and the neighbours all collected in the boy's father's house, they begin with the most important part of the ceremony; that is, they fill their bellies almost to bursting at their good host's expense, and then all mount, the boy on horseback, the rest on dromedaries and horses. They descend thus to the water, whether well or river, where the boy and any other of the party who may wish it wash themselves and their clothes, and then remounting return with even more ceremony than when setting out—the girls meet them on their return with “zugarit.” On arriving at the house the boy is seated on a “guddah” (a bowl reversed), and a piece of the pith of the durra cane being introduced into the foreskin, a thread is tied tightly between it and the gland, and the foreskin and pith being held by the left hand of the operator, he cuts at the thread with a razor; a sort of poultice is then applied and all is over. If the boy cry out during the operation it is the greatest shame for him. The boy then sleeps and every one returns to his peaceful home. The mother takes the foreskin which is sent to her, and wears it on the second toe of her right foot until it wear away or fall off itself.

Marriage is a very formal and important ceremonial. When a young man wishes to marry he first asks permission of his father; his parent, if he think his son fit for the marriage state, giving him permission, tells him, at the same, to look out for a wife. The son, very well pleased with this commission, starts off, and passes in review all the pretty girls of the tribe, until he finds one unequalled in qualities and accomplishments, both personal and mental. The personal qualities she should have are, thick legs,

a broad and heavy stern like a dutch boat, eyes (as Homer has it) like an ox's, and her copper-coloured skin shining from the dilka, which blackens her clothes and leaves an odour a mile off, and an enormous quantity of wool in a bush on her head well plastered with suet, and well scented with some spice or essential oil to prevent its stinking. Such a Venus, if she know how to weave a little cotton into thread on her bare thigh, and will take the trouble to swing the kabota a little every now and then, is, indeed, a perfect choice, although she may aid her husband to a head-dress like Falstaff's, on the occasion of Herne's oak; but this is of little importance if it does not make too much talk, and perhaps after a month or two she may demand a divorce, on the plea that her husband does not provide her with a sufficient quantity of grease for her hair, or mesüh for her skin, which is here considered a want of matrimonial consideration, that, even in the best-regulated families, is sufficient to cause a separation for life. The son starts home, post haste, and tells his father that such a one, daughter of such a one, is in his eyes the perfection of the sex and the flower of the tribe; the prudent father assents, and although in his heart he may have some objection to the girl's family, conceals this, and promises his son to make the necessary proposition to the girl's mother. Accordingly, he goes to her, and if he proposes and is accepted, all is well; but it may be that he is refused, or it may happen that he, not wishing the alliance, goes to the house and never opens the subject. In either of the latter cases, he returns to his son and tells him that he has been refused, at the same time feigning to be exceedingly vexed by the refusal, and by saying to his son, "How have you had the ill luck to fix on such a place for your wife—they have insulted your father, and you, and all the family; and after all, what is their quality or her beauty that they can refuse an alliance like ours?" and by such-like discourses endeavours to dissuade his son by exciting his anger. A love-sick swain is not so easily made to forget his mistress, and the lad generally takes off by stealth to the girl's house, and making a bold face, pops the question to the mother in person. If she confirm his father's words, saying, "Will not one answer suffice you?" he returns really angry, and thinks no more of her; but if, on the contrary, his proposition be well received, and he be simple and dutiful, he returns to his father and tells him, and then, whichever of the two has read the most logic, gains the day. But usually the lad understands the affair, and if really in love determines to be married in spite of the parent. So at night he borrows or rather takes a she-camel from the herds of one of his relations, and cuts her tendons before the door of his intended—usually, however, he lets his male friends into the secret. There is a custom among the Arabs, not only here, but in other

tribes of Arabs, called "silf" or "sillees." This is between relations a mutual concession of cattle for slaughtering on occasions of festivity—for example, a boy takes, without any account, from his uncle on his marriage, if he be on bad terms with his father, or if the latter have not the means sufficient. The payment of this sort of loan is never demanded, only afterwards his cousins or their children will on similar occasions supply their wants without any ceremony from his or his children's property.

As the *nàgah* has been hamstrung during the night, the next morning the news is spread that such a man's son has killed to such a man's daughter, which is equivalent to a marriage. The father, of course, is not over-pleased at this news, and determines to do all he can to impede the affair. Indeed he makes great difficulty to consent, and even when his son, collecting all his friends, comes to beg his pardon, he would probably be refused unless he happen to have the good luck to induce some great man or chief to second him. Having at last obtained his father's pardon and approbation, the nuptial ceremony proceeds on its course. First, he propitiates the girl's mother with ten dollars [I am about to describe the marriage of a rich man] for ear-rings; these are two pair, one pair for each ear; and as five dollars is no trifle in weight, they are supported by a string tied over the head. The four *ferda* and three *ganja*, or country cloths, which are very narrow; the *goorbab*, which is a cotton cloth of Egyptian manufacture, of dark blue, checked with a red stripe, used by the women in all these countries for wrapping round the loins; and lastly the *sohleea* or *ferda* with a red border. After the acceptance of these by the girl's mother, the poor *nàgah* is killed, and her flesh, fat, and liver are divided, each into four equal portions, of each of which one portion is carried to the boy's father's house, and the remaining three portions are left to the girl's family. Then all the friends are assembled, and (if the parties "about to be joined together in holy matrimony" be of different tribes) each one assembles his brethren to his house; but if, as is more usual (the Arabs preferring to marry with their cousins that the money may not be dispersed), the parties be both of this tribe, then two-thirds of the tribe (men and women) collect at the bride's house, and one-third at that of the bridegroom. The meat is then cooked, and the guests feed; but not one dinner suffices them, for when what is offered them is finished they change places, the party of the bride passing to the bridegroom's house, and *vice versa*. Now, as at the bride's house two-thirds fed on three-fourths of the meat, while at the bridegroom's one-third fed on one-fourth only, it is reasonable to suppose that in the former establishment there would remain one-fourth of the meat to satisfy a second time the new-comers, while in the latter the lad's father has to kill a cow, or two or three sheep.

It is rather an odd custom to eat two luncheons in one day, and that in the forenoon; but it would astonish no one who has observed the voracity of these children of the desert when they can get their food gratis. A friend of mine, when residing with me at New Dongola, fed with me regularly three times a day, and ate with tolerable moderation, which astonished me, till I heard that he never refused the invitations of the principal servants, with whom he usually found himself at the hour of eating, and regularly partook of the hospitality of my friend and neighbour, Mr. J. Morpurgo. On returning to Merawy one evening, I gave him for his supper a loaf of bread (about twice a penny roll) and a fowl; when this was finished, another piece of bread and half a fowl, which he washed down with about a gallon of milk, and then reposed; next morning, at breakfast, he remarked that an early breakfast was a very good thing, as riding on an empty stomach was not advisable. "Especially when one sleeps fasting," I replied. "Never mind," said he; "on a journey one must make up one's mind to live on a little." And yet these same fellows, when they travel at their own expense, do really live on very little.

At noon, leaving his guests to the care of his son, the father rises, and accompanied only by two or three intimate friends who act as witnesses, proceeds to the father of the girl, and counts to him all he possesses in money, slaves, and cattle of every sort. Then, according to his means, he writes for his son fifteen dollars for his bride's bracelet; six for the ornaments worn on the head; five for a pair of earrings; a gold ring, weighing probably half an ounce, for the nose, a female slave for the service of the house, twenty to thirty sheep or goats, and thirty camels, fifteen to be delivered now and fifteen afterwards, a horse, dirra (or chain armour), and a sword. With such a fortune a young man is well set up in the world, and has no further claim on his father's property. If the father be not in condition to pay the sum, he puts his right arm in gage, meaning that he will procure all, either by working, fighting, plundering, &c. This being arranged, the women build the bridal tent, which is a work of a few minutes only; and he, returning to his house, collects the women, who sing and dance, and zugrut, and the men on horses and dromedaries show off their horsemanship and the activity of their animals by galloping about, and performing all sorts of evolutions, sham fights, &c.; and thus he leads his son, mounted also, to the lately pitched tent. The bridegroom remains mounted outside the door, till two young men, who have been sent to the bride's father's house, bring her, carrying her in their arms; they then turn her seven times round the house, and introduce her, and, setting her down, she stands in the middle of the room till the bridegroom descends from his horse, and enters also; he is accompanied by a little boy as sword-bearer, and she by a woman

who is called wuzeera, and acts as counsellor and hair-dresser. This woman is usually either a widow or a divorcée. They sit all four together on a serrere, the happy couple in the middle, and their companions one on each side, the bride and wuzeera on the left hand of the bridegroom and his sword-bearer. Then the gentleman very politely makes use of his bride's lap as a pillow, placing his knee over it, and reposing his elbow on this, and his head on his hand; in this very agreeable position he converses with the friends who may be assembled till sunset, she remaining silent, the people outside continually dancing, singing, and manœuvring their horses. At sunset the bride and her wuzeera get up and, leaving the bridegroom, go to her father's house, where food is prepared for them; when she has eaten and drunk, her father carries food also to all the guests assembled in the bridal tent; these having fed, each one retires, except the near relations of the bridegroom, who remain with him all night, while the intimate female friends of the bride also pass the night with her in her father's house, keeping up the singing and dancing till morning. Next morning a "guddah," containing the kidneys and heart of the nāgah is sent from the bride's family to her spouse, who invites all the principal men to partake of it, beginning with his uncle, if he have one, only excepting his father; he himself looks on, but does not join in the eating. When the party separate he rises with them, and, accompanied only by his sword-bearer, invites himself to the house of one of the party, who may be either a man of rank or rich, or a particular friend of his. Here a sheep is killed, and he feeds; then the women "dillik" him, and he sleeps till noon; on rising he is again submitted to the "dillik," and feeds; his head is anointed with perfumed suet; he receives a present according to the means of the master of the house, *i.e.*, a dollar or a sheep; and returns to his bridal apartment, where he remains till aysheca (after sunset) alone with his page. About this hour the bride and her wuzeera come alone, and sit on the serrere near him. The wuzeera sits behind the bride, having her between her legs, and encircling her with her arms, and, armed with a small stick, about the thickness of one's finger, prevents the bridegroom from touching her; while he on his part does his best, not simply to touch his intended, but to scratch her thighs with his nails, which are left to grow long on purpose. [This custom appears to prevail in all these countries, although with variations, and almost all persons about to be married, let their nails grow to a disgusting length, protecting them against use by wearing, as a bag, a piece of sheep's gut on each finger.] So the polite bridegroom scratches till the blood runs, and the more wounds he succeeds in inflicting, in despite of the stick which taps vigorously on his knuckles, the more he is considered worthy of the esteem of his

bride. When he is tired of this work he dismisses them, by quietly and politely kicking them both to the ground, when they run to the girl's house, leaving him to sleep alone. This is the privilege of the wuzeera, who refuses the bridegroom the least liberty with his bride till he gives her a present. Next morning the wuzeera comes before sunrise, and brings the breakfast she has prepared, and, when they have well eaten, dilliks them (*i.e.* the bridegroom and his page). At sunrise they leave the woman, and, as yesterday, go to the house of some one; and here, as before, they receive a present, grease, &c. As soon as they are fairly out, the bride, who has been watching them, joins her wuzeera in their house, where they remain until noon, when the boys return; as soon as they are in sight, the cruel fair one, in order to annoy her lover, makes off with her wuzeera. The affair begins to be annoying to our hero, but in order that it pass not off shabbily, it must yet continue a day or two. He sends his page to call the wuzeera, who obeys the call; then he endeavours to persuade her by threats and promises to yield him his bride; at last, waxing hot, he beseeches her; and finally, as if forced by his passion, he promises her a present. She forces him to swear that he will give it her, which he does either by the head of his father, &c., or some other strong oath. At length he has persuaded the wuzeera to let him have a meeting with his wife, at which she is not to interfere, and accordingly she brings her to him, and, leaving them and the page in the tent, goes and sits down outside. The bride is covered, for the conditions were only to leave her with him, and the wuzeera has instructed her well, neither to speak nor allow her face to be uncovered *gratis*. But this does not satisfy the gentleman, who seeks to uncover her while she struggles, till, when nearly succeeding from superiority of force, she screams out, and the wuzeera enters, and with her stick driving him off, they return home to her mother. But the old people begin to think with us that the affair is getting long, and that as we have wasted a good deal of ink, so they have spent a good deal in the sheep, cows, beer, bread, &c., which have been consumed these last few days, and so the girl's father, addressing her mother, threatens to divorce her if he see his daughter come to sleep in their house again. During the day the wuzeera has been plaiting and arranging the girl's hair; but, after her father's oath, she is obliged to stay with her husband; and in the evening they go to his tent and remain all three together, the wuzeera in the middle; but this night she has changed from the fierce guardian to the humble suppliant, praying and adjuring the bridegroom to leave her only this once more with her, and promising after this night to interfere no more with their matrimonial arrangements. He is obliged to consent. Next morning, as soon as her father is gone out, the women return to his house to finish

the tressing of her hair and to smoke her. The bridegroom goes out on his begging visit as usual ; but during the morning he sends his page to beg a sheep at his father's house, which is taken and killed before the bridal door ; his mother also takes flour and makes bread ; in the same place, where this is prepared and the meat cooked, the bridegroom is called and returns to his tent (the bride in the mean while is with her mother). The food is put in a gudadah, and left in the shade of the tent as caràma, or an offering, from which any passer-by may eat. When this is done, and all the company assembled, the bride is brought, and entering the house sits on her husband's left-hand, all the people ranged in front. She is dressed in all her finery, gold, silver, &c., well smoked, tressed, and anointed, and covered with a cloth, face and head. Her husband, taking the edge of the cloth in his right hand, turning towards her, uncovers and covers her seven times, saying, as he uncovers her, "I uncover you under auspices of wealth," and as he covers her, "I cover you by offspring." Then the bystanders dispute among themselves, the girls with the boys—the girls saying, "Our bride, is she not prettier than your bridegroom?" and likewise the boys giving the palm of beauty to the man, when at last, to settle the affair, one from the latter party, stepping out, puts the girls on their oath till they swear that the advantage is with such a one. The mother of the girl is outside to hear all this, and then she sends the wuzeera to bring her daughter. She takes her, and dresses her in trousers, and over the trousers a cloth, which is first tied round the waist, and then passed between the legs, and well secured behind by cords. The wuzeera then conducts her to her husband, and receives from him a present of a dollar, when she and all the company, *even his page*, rising up, leave them alone. This is towards evening. He begins to talk to her, but she never answers till he gives her a she camel and some dollars to open her mouth. So far so good ; but evening is come, and she must consult her mother first ; he presses, and she refuses, till at last he is obliged to consent. She goes to her mother, who, *on receiving the dollars*, undresses her and sends her alone, and clothed only in the ferda.

The marriage being concluded, the happy couple remain together for forty days, during which time they neither work, nor indeed even wash their clothes, only the bridegroom occasionally visits his friends, but he must see sunrise and sunset in his house. After the expiration of the forty days the bridegroom's father brings a sheep, which is to be killed as caràma, the wedding garments are washed, and the water, instead of being thrown away, is carefully poured out under the bridal couch. The couple put on new garments, and go to their work and affairs, separating each one to the parent's tent. If the houses be near, they usually sleep

together, but if far off they never meet till the day they settle. A few days after their separation the bridegroom's father calls on the bride's, and demands his son's wife, as he wishes to settle his son, in order that the work may go on more regularly. The girl's father puts off the time twenty days or a month. At the end of which time her mother, taking corn, makes beer, and fills a pair of rai on a camel, and six or seven booram, which are carried by the slaves, and takes them with her to the bridegroom's father, who, on their arrival, kills a *nàgah*, the skin and rump of which are the perquisites of the mother. Then arrives the bride in her *shibe-reeya* on one camel, her tent on another, and a load of corn on a third. Her tent is pitched in front of her stepfather. The friends make beasts of themselves, eating, drinking, dancing, and singing for two days. The man and wife are then considered settled, and may quarrel or agree *ad libitum*.

At the death of one of the tribe his friends and relations assemble and weep in his house, embracing one another, or rather each one puts his arm on his neighbour's shoulder and weeps, saying "Oh, my friend, ha-y!" "Oh, my brother, ha--y!" "Oh, my mother's son, ha--a--y!" &c. Those who happen to be absent on the occasion, on their return, or on meeting with one of the family, even if years have elapsed, on hearing the news, perform the same ceremony. Then they rend their shirts, and throw dust and ashes over their heads; and after sewing him in his winding-sheet, each of his near relations takes a strip from the remainder of the cloth and binds it on his forehead. Then they bury him, and return silent and sad to his house; while they weep, his brother or son endeavours to console and silence them, as in all Moslem countries to weep for the dead is unlawful, marking a want of submission to the Divine will. The women in the mean time beat the *nugàra*, or drum, with a single stick at regular intervals, much to the same lively tune as our knell, and all the females dance, with their clothes and faces dirty and neglected, to this measure. For three days the male and female relations remain seated in sorrow and silence. After this the friends send a mounted man to each of the neighbouring tribes, who relates that such a relative is dead, and begs of them to assist at his "*agíry*" or (as it is called in other parts of Soudan) "*arda*." A day is appointed, on which the tribes assemble, all armed, men and women dressed in all the finery they possess, and bringing with them all their camels; only the children and flocks are left behind. At the village of the dead man preparations have been made for their reception. A *nàgah* is killed, a post is set up in an open space in front of the village, on this is hung the *nugàra*, which is beaten a little before daybreak. At sunrise the tribes arrive and form a circle round the *nugàra*, leaving only one opening in the

ring by which the herds enter, and pass in review before the assembly, who make remarks on the quantity and quality of each man's cattle. As each herd passes out, another enters, a horseman rides on one side and a dromedary man on the other of each herd, to prevent confusion. When they have all passed in turn, last of all enters the herd of the family of the deceased. Each fat *nàgah* has a bell tied round her neck. As soon as they have entered, instead of passing round and out like the rest, the entrance is closed, and they turn round the space three times, and then pause in the centre. The people then taking the young camels throw them down and hold their fore feet over their heads. Any one who knows that a young camel will not submit to any liberties being taken with his person without screaming out, may imagine what sort of a noise they would make in this rather disagreeable posture; so they cry out, and their mothers answer them, and all the herds inside and out join in this mournful concert; the whole people, horse and foot, and the women wail in company. Every one knows the voice of a young camel when excited by fear or anger, their mothers answer them by a long moan, and the whole forms a really sad concert, which is kept up for nearly an hour, when the herd is turned out, and every house in the village brings a camel laden either with grain, bread, beer, or water. The near relatives usually bring of the two first articles, but every one brings as much as he can, for if he bring liberally, others, of course, will do so on the first funeral in his family; and if he provide water he will receive as much on a future occasion. The loads of each article are placed together separate from the others. Then the dancing and galloping of horses and dromedaries are continued, tribe after tribe; first the men mounted, and the dancers, and last the family of the deceased. They remain two or three hours, and, when they separate, the guests are divided among the houses, and each host takes from the collected fodder for man and beast as much as will feed the guests allotted to him.

The strangers pass the night at the deceased's village, and next morning return to their homes. Then the relations of the deceased assemble at his house, and all, male and female, excepting the old, shave their heads and burn their hair in the house. If there be a young widow, she sits in the back of the house, with her face towards the wall, and neither sleeping nor rising may turn her face towards the door, excepting when she has occasion to go out, when she covers her head and face entirely, only leaving open one eye. If she be young, her mother, or aunt, remains with her during her forty days of weeping, as do her relations for the first eight days; but should she be old, she only passes the eight days with the rest, and then goes about her business, having first put

on her wrist an iron bracelet, which she wears till her death as a sign of her having determined on perpetual widowhood.

The other *camel* Arabs of Kordofan are the Hababín, who may be subdivided into the tribes of Majanín (mad men), residing near Búaira; Nowahy, ditto; Jellaydat, ditto; Ferahny, near Shershar, N. of ditto; Meramreea, ditto; Wullád Bidayr, ditto: and the tribes of Dar Hammar; the Jay-zar, Subbayhar, Arraygat, Wullad Yahíya, Nas Abu Dugl, and Simma-al-Batal.

All these Arabs, as well as the Bukkara, give much trouble to their governors, the Turks, who are obliged to send troops constantly on account of their non-payment of tribute.

XIX.—*Extracts from Notes taken during his Travels in Africa, in the Years 1847-8-9, by the BARON J. W. v. MÜLLER, Austrian Consul-Gen. in Central Africa.*

[Read March 25th, 1850.]

My journeys into Africa were exclusively devoted to science, and to the study of nature; but I could not help bestowing some attention to the advantages that might be derived from the civilisation of that most fertile portion of the globe. I shall therefore touch here and there upon the practical, as well as upon the scientific, results of my expedition. I may premise, that I had prepared myself for the task I have undertaken by studying natural science under some of the most distinguished Professors in several universities, and that from my earliest youth the observation of the phenomena of nature had excited in me the liveliest interest.

* * * * *

I had proposed to undertake a scientific journey through Africa, traversing it from one coast to the other. Foreseeing the difficulties attending such an undertaking, I determined to prepare myself in such manner as to ensure success. I therefore left Europe in 1845, in order to accustom myself to African travelling, and went to Algiers, with a view to acquire a certain knowledge of the language, manners, and customs of the inhabitants of that country. But I had made an unfortunate choice, for the influence of the French had almost annihilated the nationality of the Arabs; in consequence of which I was induced to visit Morocco, where I was equally unsuccessful. I was made prisoner by Abdel Kader, and, though but a harmless naturalist, was treated as a French spy, and was near losing my head, which was the fate of my companion.* The hardships, however, of my first journey,

* The accounts of the first African journey of Baron v. Müller in 1845 appeared in the *Isis* and other German periodicals of the day.—ED.

but increased my enthusiasm for a second expedition; and on the 1st of July, 1847, I left Vienna, in order to proceed to Greece and Egypt by Trieste. From Trieste I went to Corfu and thence to Greece. On the 9th we anchored in the bay of Corfu, and the panorama which here surrounds the ship is certainly one of the most beautiful in the world.* The whole of the bay seems to be completely land-locked; the narrow outlets S. and N. are hid; and while the island surrounds the gulf on three sides, the mountains of Albania seem to close it on the fourth.*

In Greece I found a copious ornithological field of research, but nothing new, and I proceeded on my journey to Cairo by Alexandria. At Cairo I was laid up some time by a *coup de soleil*, during which occurred the well known earthquake.

In September I proceeded on my journey to Central Africa, in company with a Catholic mission. Egypt and Nubia are so well known, from the reports of former scientific travellers, that I may be allowed to pass over everything that occurred prior to my arrival at Dongola.

The town of Dongola itself, at present the most important of Nubia, is indebted for its origin to some barracks erected to the S. of the ancient city of Dongola, which had been destroyed by the Mamelukes. The barracks were constructed after a plan made by the celebrated naturalist M. Ehrenberg. The common people call the town simply El Ourdi (the barracks). A number of habitations were gradually built round the government edifices, forming a considerable town, and a resting-place for the caravans from Kordofan and Sennaar.

At Ambukol, where the Nile changes its direction from W. and E., to N. and S., I left the river, in order to continue my journey to Khartum across the Bahiuda desert.

On the last day of 1847 we arrived towards evening at the Bir (well) el Bahiuda, for the waters of which we had been longing. It is a hollow, about 14 feet deep, and in diameter 20 feet, in which there is rain-water, green, slimy, and covered with white scum; so full of life is it, that it offers the best opportunity for microscopical observations. This water, however scanty, is sufficient to enliven the immediate vicinity of the well with some vegetation, and we celebrated the advent of the new year in copious draughts of its water.

Water, in the desert the most necessary of all the necessities of life, should not be carried in skins according to the custom

* In Corfu the Baron collected a few specimens—as, of mammalia the *Myoxoglis*, Linn.; of birds the *Larus marinus*, *Turdus cyaneus*, and *Emberiza melanocephala*. He saw the *Sylvia olivetorum*. The *Falco rufipes* is common, and the *Falco nisus* rare. The olive, *Cupressus pyramidalis*, etc., *Cactus opuntia*, abound. He found the *Astarte carinata* and fossils of *Pecten*, *Dentalium*, *Nucula*, and *Echinus*, as well as vestiges of *Dicotyledonous* plants.

of these countries, but rather in tin cases, which might be secured in wooden ones. This will preserve the water from the effects of the simoon, which dries up the skins; nor will the water be so likely to be lost in consequence of prickly thorns or hostile spears often piercing the skins. I have remarked that water carried in tin cases is fit for use even after thirty days' travelling.

In the south-eastern portion of this desert, near the Jebel Hadeli, I discovered on the 3rd of January two curious bustards (*Otis houbara*). A zealous ornithologist can alone conceive the pleasure I experienced when I saw this rare species. I succeeded in killing one; and knowing the scientific discussions to which this scarce bird had given rise, I did my best to obtain some more. After sending all my men in search of another which I had wounded, and even setting the "*chala*" on fire, I was obliged to content myself with one, a female *Otis houbara*, which I now preserve in my collection.

We proceeded slowly across these immense steppes, and gradually approached a country forming a decided contrast to the Sandy Desert, the Sudan.

This Belled-Sudan, which comprehends the countries of Sennaar, Jezirah, and Kordofan, is now under Turkish jurisdiction. The history of those countries begins with their conquest by the troops of Mehemet Ali, and gold was the inducement which brought the Turkish soldiers into this country. The gold-washings at the Tumat, the Tassanejora, Kassan, and Jebeldul, contributed to spread the metal in great quantities among the natives of the country; and when the Turks came they found an unexpected supply of the precious ore. But the inhabitants were soon plundered of all they possessed, and from that moment began the misery which they were destined to experience. The Egyptian army went into Kordofan in search of the gold sources, and they spared this country as little as those which they left. The rumours about the enormous treasures of Sudan induced Mehemet Ali, then 72 years of age, to undertake that journey himself in 1838; but he soon returned, convinced that the reports of the riches had been most fabulously exaggerated.

In speaking of these countries, I cannot help repeating a remark which I frequently made in different places—viz., that it is possible to extract from Central Africa a rich supply of gold for the whole of Europe, if the enormous resources it possesses in natural products were made at all available. The luxuriant forests of Central Africa, full of senna, tamarinds, mimosas, gum, and ebony; its immense, but uncultivated fields, with their innumerable herds; its ivory, gold, copper, iron, and other metals; offer, indeed, sufficient ground to engage the attention of the commercial, industrial, and intellectual people of Europe.

Even at the time of Mehemet Ali's expedition, there were some European merchants who perceived that there was much more to be obtained than gold alone. They even engaged in several speculations, which succeeded so well that they attracted the attention of the Pasha, who immediately restored the monopoly, in favour of the Egyptian government, which he had abolished but two years before. This at once ruined the commerce of the Europeans. It shows, however, that there is nothing to prevent all manner of commercial intercourse with that country, with a powerful authority in the interior, and an equally powerful protection without, in order to avoid a clashing of European interests with the arbitrary will of the Turks or Egyptians.

It is true that Ibrahim Pasha promised, on his ascending the throne, to remove all monopolies; but death did not allow his carrying into execution the promise he had made to the representatives of the European powers. His successor, Abbas Pasha, repeated that promise to the Consuls, and kept it. The present is, therefore, the most favourable moment for establishing connections with that country. The following articles are such as occur, after a superficial examination of the produce of that country:—

1. The mimosas, which exude gum, cover immeasurable plains. Gum arabic, which hitherto has been brought into commerce through the means of the Turkish government, forms, as I have had plenty of opportunities of convincing myself, but an insignificant portion of the quantity which might be procured. The Turkish government obliges the Arab tribes, subject to it, to collect annually the gum, and has fixed a certain price per cantar (about a hundredweight). This sum, however small, is not paid regularly, and a great part of it is deducted for taxes; it is also frequently diminished by the arbitrary proceedings of the inspectors. It is natural that, under a system of that kind, the inhabitants have no inducement to collect; and it is only by awarding them a remuneration, in some way proportionate to their labour, that they will be induced to gather the gum in any quantity. They begin to collect immediately after the rainy season is over, when the trees begin to exude. One person may in a good year collect 2 lbs. per day; consequently, a family of five persons will obtain 3 cantars in a month; and if the price for a hundredweight be, what it usually is, from 150 to 200 piastres, this would give the natives unheard-of riches, and the buyer might be certain of larger quantities. As far as I have been able to observe, the quality of the gum improves, as you approach nearer the equator; that of the Kordofan being better than that of Arabia. There are primitive forests of mimosas beyond

the Turkish territory, which the natives, who are free and do not desire to deal with the Turks, leave entirely untouched.

2. Ivory is to be found in the S. of Kordofan on the W. bank of the White Nile. The Shillucks, the Dinkas, the Taggalis, and the Nubas, possess it in incredible quantities; beside that portion which is sent out annually for commercial purposes, various negro princes have magazines filled with it. This branch of commerce is more especially watched over by the Turkish government, and the governor-general of Sudan, Ali Pasha, who is himself interested in that commerce, forbade scientific travellers to visit the White Nile, lest they should betray the existence of those treasures to Europeans. This happened to Mr. Zenkowski, who had been sent into that country by the Imperial Academy of St. Petersburg. It is true that, notwithstanding the strict watch which the Egyptian government keeps over that monopoly, there are some Englishmen at Suakim, on the Red Sea, who buy the ivory from the Haderbi, the natives of that country, who bring it from Kordofan and sell it at a good price, and for ready money—but this sort of commerce is not unattended by many difficulties. The actual condition of the commerce in ivory may be stated as follows:—The annual importation of ivory from the Darfur is from 300 to 500 cwt.; from 60 to 100 from Taggali; from 500 to 600 from Tambu, which is S. of Kordofan; and from 50 to 60 from the other countries round Kordofan. The usual price for a cantar, in ready money, is from 850 to 900 piastres; or 1050 piastres, one-half paid in money, and the other in merchandise; or 1200 piastres, if paid two-thirds in merchandise and one-third in money. All this refers to the better sort of ivory—if the Haderbi are on the spot the cantar rises to 1200 piastres, ready money. They only call those teeth tusks (*sin* in Arabic) which are perfect, free from blemish, and weigh more than 15 lbs. The second quality is called *masheket*, which is a large fine tooth, but with a fissure in it; if water poured into this tusk does not flow out, it then belongs to the second quality; but if it does, it is classed among the red tusks, which form a third class. This third class consists itself of two subdivisions: 1st, *bara*, i.e. a tusk which weighs less than 15 lbs.; 2nd, *shamsie*, or tusks of dead animals, which have been long exposed to the weather, in consequence of which the skin peels off, and sometimes three inches of the tooth are lost in that way. These two subdivisions are much cheaper, and they even reckon the cantar at 150 lbs. It is necessary that the tusks should be carefully and firmly stuffed with cotton, grass, &c., before exporting them; the openings should also be closed with moist skins, in order to prevent the tusks from splitting; the final operation consists in sewing up the tusks in leather.

3. The tamarind (*Tamarindus Indicus*) forms large, shaded woods, and the blacks know the salubrious qualities of this medical agent, which is not sufficiently appreciated in Europe. They prepare it for their own domestic use, but they do not collect it, for there are no buyers.

4. Senna is so common, that one might imagine the country had received its appellation from this plant, which would at once remove all the difficulties of the name; for it has been explained as consisting of the words, *Sin el naar* (tooth of fire), or *Seie el naar* (like fire). The leaves of the senna have been sparingly introduced into commerce.

5. Ostrich feathers are found in great quantities among the Kubbabish and Hassani. There are not so many found among the Bagara and the Darhamar Arabs, who hide them from the Turks, because every Turkish soldier imagines he has a right to take them by way of tax.

6. Ebony, though not of the best kind, may be plentifully obtained in the forests.

I pass over the other well known riches of Sudan, such as gold, copper, iron, hides, &c., and need not remark that many more unknown treasures are likely to be brought to light, by a more accurately scientific examination of the country, and by an increasing commerce. With regard to the capabilities of this country for production, I need only mention, that it is in the same degree of latitude as the East or the West Indies, and that it consequently is good for coffee, sugar, rice, and spices; the only thing that is wanted is colonists, and these might easily acquire as much land on the other side of the frontiers of the Turkish territory as they can possibly desire. The operations would be aided by the presence at Khartūm of European representatives.

The town of Khartūm itself is situated at the confluence of the Bahr el Abiad and the Bahr el Asrek, which circumstance has contributed to make it the emporium of Central Africa. The White Nile carries into it, from the most distant parts of the country, ivory, ostrich feathers, gum, animals, &c.; which valuable objects may be obtained in exchange for beads of Bohemian glass. On the Blue Nile are conveyed gold, Abyssinian coffee, senna, tamarinds, &c. To the W. of this town lies the great tract of caravans from Darfur and Kordofan. All these objects, as well as the slaves (the slave trade not being yet abolished), are sent from this place to Cairo, the Red Sea, and the Mediterranean. On the 5th of January, about 600 unfortunate Shilluck and Dinka negroes arrived at Khartūm from an expedition of Haled Pasha, in a most deplorable state; there were among them also a few Bagara Arabs, who are Moslems, and who

have received a sort of civilisation through the colonies on the White Nile, but whom the Turks had made prisoners. Every one of these unfortunate men, who did not submit to become a slave, was butchered. They were given to the soldiers at Khartûm, instead of pay. On my journey from Khartûm to Kordofan I arrived at Haschaba, where I discovered a new tribe of Arabs, who live entirely isolated, and do not mingle with any of the surrounding tribes; they are called Madjanin, and are not described by any of the European travellers who have been in these parts before me. Their manners and customs, as well as their dialect, differ so much from those of the other Arabs, that they well deserve our attention. Their principal places are the villages of Haschaba and Gnjemat, $13^{\circ} 30'$ N. lat. and $38^{\circ} 46'$ E. long. None of them are nomades, nor do they live by breeding and rearing camels, as their neighbours the Kubbabish, or, like the Hassani Arabs, who rear horned cattle; but they derive their principal means of existence from the cultivation of dokhen (*Pennisetum typhoideum*), which forms their chief article of food, and from gum-arabic, which they are bound to give up to the Turkish government as tribute. The dokhen in Kordofan is the substitute for the durra (*sorghum vulgare*), which is cultivated all along the Nile, although the latter contains better nourishment. But durra requires more moisture than it can obtain in Kordofan. They sow the dokhen in the month of July, at the beginning of the rainy season, and reap it in October, and in such a manner that the Arab eats his bread, as his proverb says, a hundred days after he has sown the seed. The Madjanins are a strong race of men, dark brown, with good features. The men do scarcely anything, all real labour is left to the women; their dress consists of a red striped cotton cloth, which is placed round their loins and thrown over their shoulders. In the evening, or when it is cold, they use that cloth as a cloak, like a Roman tunic. Their head is always uncovered; and their hair, which is long and curly, is plaited into three or four thick tresses, which fall behind the ear. They wear leathern sandals, and their only ornament is the Mohammedan rosary, which hangs round their neck, and which is the only sign of their faith in Islam. Both men and women are, however, loaded with amulets, *i.e.* words from the Koran written on paper and leather. They often carry a small dagger-like knife on the upper part of their left arm, which is a prevailing custom among the Dongolawi; but they very seldom appear without their spear, which is six feet long. The women dress like the Hassani and Kubbabish, *i.e.* the girls are naked until their fifth or sixth year, when they put on the *rahat*, until they are fully developed, they then substitute in its stead a cloth which they suspend from their loins. Their features are handsome; they adorn the head

and neck with bits of silver, amber and glass beads; and on their arms and ankles they wear rings of silver, brass, or iron, as well as in their ears and noses. They do not use bracelets of ivory, but peculiar ornaments of the little girls are brilliant shells (*cyprea vulgaris*), which hang on the *rahat*,* and designate maidenhood.

The women have their hair plaited into innumerable tresses, which they saturate with butter. As I have observed before, they do all the work in and without the house; they sow and reap, tend the cattle, look after the concerns of the house and kitchen, construct and repair their dwellings, and grind the corn. This last occupation is very hard and tedious, and yet they go on with it from sunrise to sunset, singing to it a monotonous song. They know not the use of hand-mills, but they stick a plate of granite (which they are often obliged to bring from the distant mountains) into the ground, in a slanting position; at the lower end there is a hollow that receives the flour, which is produced by grinding the corn with a similar stone of smaller dimensions. There are no traces of education among them, but they are, nevertheless, strictly moral. The nourishment of the Madjanin consists almost exclusively of bread, which they bake, on a round stone called *dokha*, in the shape of flat cakes, which are difficult of digestion, and have a bitter sour taste. Another dish is the *asida*, a sort of paste made of flour and milk, and into which they now and then put dried bananas. They eat meat only on extraordinary occasions, drink nothing but their bad salt water, collected in cisterns 24 fathoms deep; at Haschaba the cistern is 34 fathoms; however, whenever they get an opportunity, the Madjanins vary their monotonous existence by drinking *bilbil* or *merissa*. This beverage is prepared by soaking and fermenting a quantity of their sour bread in water. Their agriculture consists in simply loosening the earth with an instrument of iron, called *hashash*, which has the form of a half moon, and throwing the seed into the soil; and yet, notwithstanding this, their harvest is so plentiful that it would more than cover the consumption of the whole year, if the Madjanins would but give themselves the trouble of collecting it. They sometimes suffer famine because they leave nearly the third part of their produce to rot in the fields.

Lobeid, or el Obeid, the capital of Kordofan, consists of many large villages united into one, called by the names of their inhabitants; as, for instance, *El Ourdi*, the Turkish barracks; *Mogarba*, the village of the irregular cavalry, called *Mogrebi*; *Conger*, or the residence of the Darfur people; *Taggarni*, the village of the Tagruri, or the black Mohammedan pilgrims; *Vadi nagile*, the

* The *rahat* is the apron of leather thongs or stripes worn by the Abyssinian women.

village of the Tongolari; *Vadi Saffi*, of the newly introduced blacks; &c. The whole of the town is constructed of toguls; these are round huts made of earth, covered with straw thatch, on which at some seasons of the year you see storks; this is the *Ciconia Marabout*, which in the month of May offers a peculiar spectacle to the ornithologist; thus the barracks of Lobeht, which consist of 60 toguls in five rows, are covered with storks, that here bring up their little ones. Every inhabitant who constructs for himself a togul, takes the earth which he wants for that purpose from before the place where he builds; and this occasions as many holes as there are houses in Lobeht. These holes are also employed as receptacles for the carcases of animals, and sometimes also for human corpses; and when, during the rainy season, they are filled with water, they produce miasma and dangerous fevers. The Egyptian hospital is a very wretched affair. At Melpess, in the vicinity of Lobeht, where I had spent some time for the purpose of collecting objects of natural history, I made in April, 1848, the acquaintance of a man, from whom I wanted to buy several animals, who for the first time put me on the trace of the unicorn (*anasa*), hitherto considered a fabulous animal.* On the 4th of July, in the same year, at Khursi in Kordofan, jellab, i.e. a slave dealer, who could have had no communication with my first informant, gave me a description of the anasa which agreed in every respect with the former; and he added, that a short time before, as he was coming out of the interior with a caravan of slaves, his people had killed an anasa, eaten it, and found it good. I proposed to go from Lobeht into the Darfur, and its capital Cobbe. Although it has been possible for white men to enter Darfur, they have never been allowed to go out of it. I therefore sent a man who was well acquainted with the country, Hadji Mohammed, with a letter to the Sultan of Darfur, in which I requested permission to visit his country, and to lay at his feet some presents. I agreed with my messenger that we should meet at El Khoëi, on the frontier between Kordofan and Darfur, where I was to wait for an answer. I did not however find my ambassador at the time I expected, and therefore I crossed the frontier and went as far as Markab which belongs to Darfur. Here I met Hadji Mohammed, who, however, gave me no written, but a verbal answer to this effect:—that if I were the bearer of a letter from my own sultan to him I might travel in his states without any hindrance, but that I might go to him, even without

* The anasa is said to be as large as a small donkey, with a thick, large belly, and fine legs; hairs stiff, like those of a hog, and the penis like that of the same animal. On the forehead is seen one long horn, generally hanging down, but when roused (and then it is dangerous) the horn becomes stiff and hard. The man had often seen the animal living in the Chala and dead among the blacks.

such a message, if I chose. But my messenger gave me to understand, by a variety of significant hints, that I would meet with some misfortune, and I therefore returned with all possible speed. On my arrival at Melpess, I made the necessary preparations for a journey into the country of the Taggali negroes, into which no European had ever been, and which the Turks represent in the darkest colours.

On the 11th of May, 1848, we proceeded in a direction to the S.E. through a country that now was woody, and then barren and bleak like the desert. My faithful companion, Brehm, was with me in advance of the caravan, and as the sun rose the next day we heard behind us a fearful cry; upon which we turned round and saw one of my servants fall from his camel struck with a spear. The confusion amongst my men was great, but still I could see no enemy. At length I perceived the upper part of a black body, behind a bush, drawn slowly back in order to throw a lance at me, when at the same moment my ball struck his breast. Now spears were thrown at us for some time, from all sides in return for our shot; another of my servants fell; the spear that struck him had been touched with poison, which the Arabs prepare from the *Asclepias proceras*. A violet coloured ring formed itself round the wound, the abdomen swelled up, the body was thrown into continuous convulsions, and a thick white foam flowed from the mouth. I saw that the unfortunate man could not live long, and I therefore went to the other wounded man, and cut the spear out of his thigh, causing bandages to be put on the wound. I only then was made aware of a wound which I had myself received. I had it carefully cleaned and bandaged, and resolved to return, for none, but my secretary, was willing to accompany me further. On this occasion I lost a collection of ichthyological objects which I have not been able to replace since.

My observations on the preparation of salt at Terah, on the left bank of the river, differ from those of Mr. Russegger on the same subject. The mud of the White Nile, as well as its water, contains a small quantity of common salt; but the natives have no idea how to get that salt from the mud, as Mr. Russegger asserts. It is true that there are reservoirs of water, of which he has given all the dimensions with the greatest accuracy; but that which Mr. Russegger takes for a vessel wherein salt is prepared, is nothing but a trough for camels. The Nile at Terah, when it is high, spreads to such a distance that it forms an immense lake; the soil is thereby softened to such a degree, that the herds of camels cannot reach the water without sinking deep into the mud, and sometimes even breaking their legs. For these reasons the natives have constructed the above-mentioned troughs. The white crust which Mr. Russegger observed on the

sides of the trough, is formed by the numerous birds which sleep on the troughs, and cover this place with their guano.

The tropical rainy season forms an interesting epoch in the physical aspects of Central Africa. According to the natives, about forty days before the setting in of the rains, the black stork (*Ciconia Nigra*) and the sacred ibis (*Ibis religiosa*) make their appearance from the S. Progressing from S. to N. in May and June, the rains increase in intensity; fearful hurricanes from the S. and S.E. occur, accompanied by dark-red and yellow clouds, throwing upon all objects a light similar to that of an immense conflagration, and suffocating clouds of dust fill the air.

It is a common saying among the natives, that when an eclipse of the moon takes place in the month preceding the rainy season, it will be followed by a strong *charif*; a fertile season, and afterwards by epidemic diseases. To travel here in the rainy season is next to an impossibility.

At the end of the rainy season, there arises in this part of Africa a regular north wind, extending as far as to 10° N. lat., from October to January and February. Curiously enough, the above-mentioned wind is felt earlier in Sennaar and Kordofan than in Egypt. Before the rains, the immense plains show only a few bushes of the *Asclepias gigantea*, interspersed with the decaying stems of the *Rhamnus zizyphus*, *Spina Christi*, and *integrifolia*; of the *Helix*, *Balanite Egyptiaca* (used as soap by the blacks), and the *Salvadora Persica* (the roots of which furnish tooth-brushes to the natives). After the rains the soil becomes at once covered with the most luxuriant vegetation, producing thereby dangerous epidemics.

Respecting the African ostrich, naturalists have differed much, particularly in their time of breeding; but I have found their eggs throughout the whole year.

In the early spring the ostriches collect together and retire to the desert, where, in March, April, and May, the female lays from 8 to 25 eggs in the sand, round which she forms a slight mound, covering at the same time the eggs with the sand. During the day the ostrich does not sit on the eggs, but remains continually near them.

The Arabs distinguish two sorts of ostriches—the *ribida* and the *etlim*. The *ribida* are more common, but are smaller, weak birds, mostly females; they are grey in colour, sometimes grey and white, but always of inferior quality. The *etlim* are older, stronger birds, having a great variety of colours, with red necks and legs; the upper part of the thigh is not covered, as is the case with the *ribida*. The flesh of the ostrich is exceedingly well tasted, and its fat is supposed by the Turks to possess highly medicinal qualities.

Knowing the importance which the Bahr el Abiad occupies in geography, I take the liberty of giving the following particulars.

Former travellers are acquainted with the course of the White Nile only up to the 4th degree of northern latitude. I consider that its middle course begins at Eleis, $13^{\circ} 20'$ N. lat., which forms the frontier of the territory of the Viceroy of Egypt, and where the Shilluks, the first Negro population, inhabit the banks and the islands of the river. The bed of the river is not hemmed in by any steep banks; it is very wide, divides itself into many branches, and thus forms as many fertile islands. It is this country which I recommend to emigrants for purposes of colonization. Everything is favourable to it; the climate being healthy, the soil fertile, and the temperature capable of rearing all the productions of India. Beginning with the 11th degree of northern latitude, the banks of the river consist of swamps covered with reeds, and after passing through the dwelling-places of the Dinkas, one arrives at the Kék Negroes, a numerous race, differing in language and customs from the Shillucks and Dinkas, to whom they are superior in intelligence, and who live by rearing cattle, and by hunting and fishing. Their territory extends towards the S. as far as $9^{\circ} 15'$ N. lat., where the White Nile receives from the E. the Sobât, or the Bahr el Mokada, a river which flows slowly, sometimes almost stagnates, through humus and clay, containing particles of iron. At this point the Bahr el Abiad takes a direction decidedly W. to E. After receiving another river, the Kidi or Kik, from the W.N.W., it falls into the Birket el Gazâl, the lake of Gazâl, which is undoubtedly formed by the confluence of the Bahr el Gazâl, which I did not see, in consequence of the enormous and impenetrable forest of reeds, but which may be the river known by the name of Bahr el Keilak. The water of the latter is clear, and contains many crocodiles, hippopotami, water-snakes and fish (*Clarias anguillaris*, *Heterobranchus*, &c.). The banks are inhabited at this place by the Nuér Negroes, who breed cattle; after them come the Kik Negroes, who all look perfectly grey, from the ashes in which they sleep.

The culminating point of the type of the negro, must not be looked for under the equator. I can prove from observations of my own, that the peculiarities of the negro organization may be first traced in the northern parts of Nubia; that it developes itself fully on the 15th degree, and that on the 12th it reaches its culminating point. At or about the 7th degree the natives begin to lose the negro type; their intellectual faculties improve, the colour of the skin becomes lighter, and their bodies are better formed. These advantages increase in proportion as the degrees of latitude diminish, and I am of opinion that we shall find under

the equator itself people who are equal to the Gallas. The same holds good in Asia.

Respecting the sources of the Nile, or rather the origin of Bahr el Abiad (not yet discovered) I hold the following opinion: the water of the White Nile, which in its lower course is muddy, contains salt, and is of a white colour, from the clayey soil and vegetable remains in a state of decomposition, becomes, under the fifth degree, clear and bluish, and the soil contains more sand. At length, in the land of the Bári Negroes, we find, under $4^{\circ} 10'$, the first gneiss rocks in the river, forming rapids like those of the Cataracts of the Nile, and the inhabitants say, "that the river proceeds from the country Ajan, 30 days' journey to the S., where it flows in four streams *from a high mountain*." A man gave me some striking information concerning the Arabic name of the White Nile. "The Bahr el Abiad," he said, "*comes from a high mountain, the top of which is quite white, and since it comes from the white mountain, they call it also the white river.*" I may add, that this man had never seen either snow or ice. The "Mountains of the Moon" (Jebel el Gamar) were by the ancient geographers supposed to be under the 15th degree. Europeans came here, found no mountains, and placed the origin of the Nile most arbitrarily in the Mountains of the Moon, which, in their imagination, were supposed to exist under the 7th degree. When other travellers extended their travels farther, they found a plain even under that parallel, and they set up the new theory, that the Nile, according to some authorities, came from the W., or according to others, from the E., but that the Mountains of the Moon were most certainly to be found under the 4th or 5th degree of northern latitude. At present we have reached that point, and yet no Mountains of the Moon have been discovered. The same thing occurred to me with regard to the anthropophagi of Africa, of whom every tribe told me to beware, when speaking of their neighbours, and yet I never met with them. If these mountains be really in the land, Ajan, we have no more right to call them "Mountains of the Moon" than any other mountain range that may happen to be discovered. On my journey from the White river back to Khartûm, the north winds were so strong that it required the greatest efforts on the part of the natives to tow my boat.

Artesian wells, dug on the way between Khartûm and Suakim, would enliven the country, increase the intercourse, and form a true caravan road for Indian commerce. In the construction of these wells, which is not difficult, considering the geological formation of the country, it would be necessary to trust to the perfect knowledge of the localities which some of the Arab tribes of that country possess. I shall illustrate this by an example. My escort consisted partly of Hassani and partly of Kubbabish

Arabs; and after a long, tedious march, I came with them to a dried-up *ghor* (bed of a stream formed by rain), where they immediately began digging for water. The Kubbabish did not know the country, and they dug three different wells, in one of which we succeeded in getting bad water at the depth of ten feet. My Hassani had been looking on quietly, laughed at the Kubbabish, and dug new wells at a distance of only a few paces from the old ones, where they obtained sweet water at the depth of from three to four feet. This quick sense of locality struck me the more, as the surface of the ground offered no means whatever for the recognition of the strata, which contained the water.

The governor of Sudan, Haled Pasha, had given me two of his own boats, with the necessary complement of men, to return to Cairo. I proposed to pass all the cataracts of the Nile, and I succeeded in accomplishing this plan. *The thirty-one Cataracts*, all of which I have passed and described in my diary, and marked on my map of the Nile, form three distinct groups. From Khartūm to the land of the Scheiki, at the point where the Nile turns from W. to E., I counted fourteen, two of which are very dangerous, and which I shall well remember on account of my double shipwreck. I counted thirteen from Dongola to Wady Halfeh, the principal cataract of which—viz., that last mentioned, consists of four others. Here I suffered shipwreck for the third time. The last and least is that of Assuan, which many European tourists have visited for amusement.

On my arrival at Alexandria, I had navigated the river through twenty-eight degrees of latitude. I arranged in Lower Egypt a scientific expedition under the direction of my secretary, Mr. Alfred Brehm (son of the celebrated ornithologist), destined for the White Nile, and to prepare for my next journey. In the course of a short time it will be able to leave Egypt, where all its members are at present collected, and where they only wait for the arrival of astronomical instruments from London and Paris. The instructions which I have given are the following: "The expedition is to go to Suakim by sea *via* Suez, and there to provide themselves with the necessary number of camels for riding and carrying burdens from the Bishari Arabs, who breed the best camels in the world. After examining the course of the unknown Atbara, and reaching Khartūm, they are to sail at a favourable season of the year, and when the north winds begin to blow on the White Nile, in order to reach the Bari Negroes,* or the rapids under the 4th degree of northern latitude. Here they are to settle for a while, to establish a settlement (plantation) for the benefit of the natives, to learn this language, and

* Since reached by Dr. Kuoblicher and party.—Ed.

to make themselves as useful as possible to the natives, in order to prove to them that there are other white nations in the world besides the Turks, who do not visit them for purposes of spoliation."

Towards the end of the year I propose to return thither, and to proceed to the S. in company with my people, with the intention of discovering the sources of the river, and to journey thence towards the W. coast. I must remark, that from the land of the Bari Negroes to Fernando Po on the Atlantic, there can be only forty days' journey, deducting the difficulty of the way. Thus I hope, by the help of God, to be able to carry out that which I proposed to accomplish for raising and quickening the intercourse between men; for civilisation and morals, and for the progress of science.

I look forward to success with certainty; and this assurance, as well as the difficulties which beset my undertaking, give me an inward impulse for its execution. The first of these motives will be strengthened by the approbation of a Society, whose authority is so universally recognised as that of the Royal Geographical Society of London, and the assurance that my humble efforts to promote geographical discovery are thus sanctioned, will greatly strengthen my endeavours.

XX.—NOTE by DR. BEKE on Mr. Ayrton's Paper (Art. VII.) in the Eighteenth Volume of the Journal.

IN making the following corrections, it is deemed advisable, in order to save the trouble of reference, to give, *seriatim*, in the author's own words, the several statements proposed to be corrected, adding under each the requisite emendation, and adducing in every instance the authority on which it is made:—

"The Gibe of Inarya, which flows to the N. of the Gojeb of the same province."—p. 50, l. 23.

The Gojeb flows between Djimma and Kaffa, at some distance S.W. of Enárea, with which country it has no connexion. See the Maps in vols. xiii. and xvii. of the Society's Journal.

"The source of the Bora, which M. d'Abbadie, from astronomical observations made by him at Saka, computes to be in $7^{\circ} 49' 48''$ N. lat., and in $36^{\circ} 2' 39''$ ($34^{\circ} 42' 24''$ E. of Paris) longitude E. of Greenwich."—p. 50, l. 28.

Paris is $9^{\circ} 21' 46''$ in time (see *Iphig. Trans.*, 1827, p. 295), or $2^{\circ} 20' 22''$ of longitude, E. of Greenwich; therefore the source of the Bora is, according to M. d'Abbadie, in $37^{\circ} 2' 46''$ E. of Greenwich.

"Dr. Beke contends, upon the authority of oral information afforded to M. d'Arnaud, . . . that the direct stream of the White Nile continued to ascend for one month's journey," &c.—p. 50, l. 33.

M. Werne, not M. d'Arnaud, was my authority. See the Society's Journal, vol. xvii. p. 68, l. 33.

"The source of the principal affluent of the Gibe [*i.e.* the Bora] is, as now computed by M. d'Abbadie, not more than 30 miles N., and as many E., of the source of the Gojeb, according to his computation of the position of that source in 1844."—p. 53, l. 9.

In 1844, M. d'Abbadie placed the source of the Godjeb "in 1° 20' W. of Sakka" (*Bulletin of the Geogr. Soc. of Paris*, 3rd Ser., vol. iii. p. 213); and in 1847 he stated that Sakka lies "due N. of the source" of the Bora (*Athenæum*, No. 1041, p. 1058). Hence, the difference of longitude between the sources of the two rivers is eighty minutes; and as this difference is relative, it must continue to exist, however M. d'Abbadie may at different times have varied the position of Sakka. In those latitudes, eighty minutes of longitude are equal to about seventy-eight geographical miles.

"The Nilus and Astaboras (White and Blue Nile)."—p. 53, l. 35.

The Blue River is the Astapus of Ptolemy, the Takkazie being his Astaboras. See *Edinb. New Phil. Journ.*, vol. xlv. p. 224, and the Maps there.

"The Gamaro mountains about the sources of the Gojeb and Gibe."—p. 54, l. 29.

Gámáro or Gimira lies beyond Kaffa, to the W.: the river Gibbe, which rises in Enáfrea, has no connexion with Gámáro or its mountains. See the Map in my *Enquiry into M. d'Abbadie's Journey to Kaffa*.

"Ludolph, in enumerating the minor kingdoms formerly belonging to Abessinia (lib. i. c. 3), and therefore of people formerly under the same national influences, includes among them Inarya and Kaffa."—p. 59, l. 22.

Ludolf (*Hist. Æthiop.*, lib. i. cap. xv.) describes the Gongas as being a distinct nation, and speaking a language totally unconnected with those common throughout Abessinia. The aboriginal languages of Enáfrea and Kaffa belong to the Gongá class (*Edinb. New Phil. Journ.*, vol. xlvii. p. 265). It was not till the sixteenth century that Enáfrea was temporarily subjected by the Abessinians under the Emperor Malek Sagad (Ludolf, *Hist. Æthiop.*, l. 3, 18; II. 6, 40).

"Of these minor kingdoms, Inarya and Kaffa, and all others to the south of the Blue Nile, have been long since overrun by invading Galla tribes, whose language has kept pace with the progress of their encroachments."—p. 59, l. 25.

There is no evidence that Kaffa was ever overrun by the Gallas: its language is as distinct from that of the Gallas as from the languages spoken in Abessinia. See *Vocabularies in the Transactions of the Philological Society*, vol. ii. pp. 97-107.

"We can assume the principal name for the moon to have been constant with the whole of the Arabs. That name would be Qamar."—p. 61, l. 10.

In the Mahrah language of Southern Arabia (Haines, in *Journ. Roy. Geogr. Soc.*, vol. xv. pp. 111, 112), nearly resembling the ancient Himyaritic or "Sabæan," *warkh* and *wárit* mean respectively *month* and *moon* (Carter, in *Journal of the Bombay Branch of the Royal Asiatic Society*, vol. ii. p. 335). The Himyaritic Inscriptions have the same word *warkh* (Tuch, in *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, vol. iii. pp. 142, 203, 204, who refers to Rüdiger's *Translation of Wellsted's Travels in Arabia*, vol. ii. p. 383). And the same, or nearly the same, word expresses *moon* and *month* in most of the languages on both sides of the Red Sea, and even far in the interior of Africa, as witness:—

Amalekite (?) of Djebel Mokatteb	<i>warkh</i>	Tuch.
Geez, or Ancient Ethiopic	<i>uarkh</i>	Ludolf.
Tigre, or Modern Ethiopic	<i>warkhi</i>	Beke.
Amharic	<i>war</i>	Isenberg.
Hárgarie	<i>warkhi</i>	Beke.
Dankali	<i>berra</i>	} Salt
Arkiko	<i>werha</i>	
Darfur	(star) <i>wirre</i>	
Sechuana	<i>werri</i>	

In the cognate northern Syro-African (Hamitish, see *Origines Biblicæ*, vol. i. pp. 226-266) languages, *yod* takes the place of *moor*.

Hebrew	(month)	<i>yerakh</i>
Ditto	(moon)	<i>yārakh</i>
Chaldee		<i>yerakh</i>
Syriac		<i>yarkho</i>

"The present local words Gamaro or Gimiro are but corruptions of the Sabæan appellation *Qamar*."—p. 61, l. 30.

The word *Kamar* is not found in the Himyaritic ("Sabæan") or ancient Arabic language (Tuch, in *Zeitsch. d. Deutsch. Morg. Gesellsch.*, vol. iii. p. 142), nor in any other "Semitic" dialect (MS. letter from Professor Fleischer, of Leipzig, dated Oct. 18, 1850). In the aboriginal Gonga languages of the countries of which Gámaro forms a part, *moon* is expressed by *A'gino* (Kaffa) and *A'gena* (Woratta and Wolaita). See *Transactions of the Philological Soc.*, vol. ii. p. 97; *Edinb. New Phil. Journ.*, vol. xlvii. p. 271, note; *Reasons for returning the Gold Medal*, &c., p. 10.

"Adulis, the modern Massawah."—p. 65, l. 19.

Arrian's description (*Periplus Maris Erythræi*, edit. Amstel. 1683, p. 144; and Vincent, *Voyage of Nearchus, and Periplus*, p. 72) shows plainly that Adule was in the Annesley Bay of Salt, thirty miles S. of Massôwa, at Zulla, where its ruins were discovered by Rüppell (*Reise in Abyssinien*, vol. i. p. 255). As early as the year 1809, Dr. Vincent expressed the opinion that Adule lay "far to the south of Arkiko," which latter place is close to Massôwa (*Voyage of Nearchus, and Periplus*, p. 72).

"Ptolemy Energetes pushed his conquests along both shores of the Red Sea, and on the African side subjugated the seaport states as far as Zanzibar, and the countries inland as far as Shawa [Shoa]. The record of this expedition was preserved in the Adulitic inscription discovered by Cosmas (*Topographia Christiana*, in Dean Vincent, &c., vol. ii. p. 531 *et seq.*)."—p. 63, l. 18.

The inscription in question records the conquests of an Axumite monarch in the third or fourth century of our era (see Salt's *Voyage to Abyssinia*, Appendix, p. lxxv). Dr. Vincent's error here was candidly acknowledged by him in his *Voyage of Nearchus, and Periplus*, pp. 118, 119, published in the year 1809.

"I would suggest whether the signification of the words *Mono Moezi* has any relation to the sense of Moon, and whether some clue to their meaning may not be deduced from the Coptic."—p. 66, l. 21.

The languages spoken to the S. of the Equator have no affinity with the Coptic, but belong almost exclusively to the Káfir family (Pott, in *Zeitsch. d. Deutsch. Morg. Gesellsch.*, vol. ii. p. 5 *et seq.*). In many of them, *mono* means "king," and *moezi* means "moon" (*Journ. Roy. Geogr. Soc.*, vol. xvii. p. 75).

"The high mountains of the Abessinian plateau, including Kaffa and Inarya, intercept the S.W. monsoon in what would otherwise be its passage across them to the mountains of Yemen, in Arabia."—p. 67, l. 43.

During a sojourn of upwards of two years among the mountains of the Abessinian plateau, I never experienced the S.W. monsoon in its passage across them to the mountains of Yemen. And Mr. Rupert Kirk's Table of the Winds at Ankóbar, in Shoa, on the eastern edge of the plateau (Harris, *Highlands of Æthiopia*, 2nd edit., vol. ii. p. 389), shows that previously to the rainy season there, the winds blow up strongly from the E. and the Indian Ocean, and in the dry season, from the Arabian deserts and the N.E.

"If there were any other mountains on the south side of the mountains of the Abessinian plateau higher than or even as high as themselves, the rain of the S.W.

monsoon would in like manner never reach them, or at most reach them with its force much modified; but the contrary is the fact."—p. 68, l. 1.

The Rev. Mr. Rebmann and Dr. Krapf have recently discovered (*Church Missionary Intelligencer*, vol. i. *passim*) the mountains Kilimandjaro and Kénia, in 4° and 1° S. lat., respectively, rising above the limits of perpetual snow. There is, however, no reason to imagine that these mountains prevent the rain of the S.W. monsoon (1) from reaching those of the Abessinian plateau.

"Assouan [is] about 97·705 mètres (= 313·86 feet Eng.) above Kahireh."—p. 69, l. 22.

According to Professor Chaix (*Journ. Roy. Geogr. Soc.*, vol. xix. p. 143), "Clot Bey says, in his *Tableau de l'Égypte*, that the level of the Nile at Cairo is 40 French [= 43 English] feet above the Mediterranean and 543 [= 579 English] feet five leagues lower down than Assouan."

"Bruce assigns to the plateau of Sennar an altitude of 4000 feet."—p. 69, l. 39.

Russegger (*Reise in Europa, Asien und Afrika*, vol. ii. part i. p. 544) has determined the elevation of the bed of the Nile at Khartum, the present capital of Sennar, to be only 1431 French feet (= 1525 English feet) above the ocean. See also the Society's *Journal*, vol. xvii. p. 80, *note*.

"We have the corroborative fact by Bruce, that the source of . . . the Blue Nile is from 9000 to 10,000 feet above the sea."—p. 70, l. 7.*

Bruce (*Travels*, vol. iii. p. 642) estimates the source of that river to be "more than two miles above the level of the sea." Two statute miles are equal to 10,560 feet.

"The Nile does not begin to rise in Egypt till the end of June, which is about six weeks after the regular setting in of the rains in Abessinia."—p. 71, l. 1.

In Abessinia the rainy season does not regularly set in, nor the Abai begin to flood, till about the summer solstice (*Journ. Roy. Geogr. Soc.*, vol. xvii. p. 26, *note*; *Bulletin*, vol. ix. pp. 227, 228). In the S. of Godjam, where the river carries in its channel the entire waters of Southern and Western Abessinia, it is not till the feast of St. Abbo, in the month of Hamlic, corresponding with the 11th of July of our Calendar, that the Abai is considered as having risen so much as to be no longer passable (*Journ. Roy. Geogr. Soc.*, vol. xiv. p. 68). At that time, the Nile at Cairo has already been nearly a month on the increase; the day on which its flooding is said to commence there, being the 17th of June (Lane, *Manners and Customs of the Modern Egyptians*, vol. ii. p. 254).

"So rare are the instances when a rise of the Nile has been observed at Kahireh in May, that its occurrence [in May, 1843] is regarded as a phenomenon (M. Jomard, *Bulletin de la Société Géographique*, Feb. 1844 [3rd Ser., vol. i.], *note*, p. 138), and may be accounted for on the supposition that the light showers which prevail in Abessinia through February, March, and April have been heavier than usual."—p. 71, l. 6.

M. d'Arnaud states, from his own personal knowledge (*Bulletin*, vol. xii. p. 338), that the phenomenon in question, in May 1843, was due to the rain-waters collected and brought into the Nile by "Wadi Ollaky, a little below Sabua, opposite the temple of Dakkeh," in about 23° N. lat.

"In 1613, the Jesuit missionary Antonio Fernandez . . . after traversing Inarya for eleven days, descended a high mountain and reached the Gibe, which falls into the Indian Ocean."—p. 72, l. 30.

The three rivers of the name of Gibe, of which the Zebee, twice crossed by Fernandez, is one, all unite with the Godjeb, and the joint stream is the head of the Sobat, Telfi, or river of Habesh, an affluent of the Nile. See *Journ. Roy. Geogr. Soc.*, vol. xvii. p. 55; and *An Enquiry into M. d'Abbadie's Journey to Kaffa*, p. 16.





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XXI.—*Notes taken during a Journey through Part of Northern Arabia, in 1848.* By DR. GEORGE AUG. WALLIN, of Finland.*

(Read April 22, 1850.)

[Dr. Wallin's orthography of Arabic words, as offering some facilities for marking the distinctive sounds peculiar to certain letters and terminal syllables in the Arabic, has been retained in the transcription of such words throughout this paper, and that usually adopted by the Society is added for each word in brackets. This has been done at the request of the Publication Committee. It will be seen that Dr. Wallin is enabled very successfully to indicate the distinction in the pronunciation of all the letters, and of the terminating syllable of words ending with a silent *tei*, according as it is to be sounded *â*, or *é*, which letters are to be pronounced nearly as in Italian, or a little broader than in French, with an acute accent; and also of a terminal *yei*, preceded by fath, by *â*, which is to be pronounced light, and though broader, yet more open than the preceding *â*. This *â* and *â* are again distinguished from the hamzá, which frequently terminates words, and which Dr. Wallin had expressed by its own mark, but which is here indicated by *â*. The sound of hamzá (which is a symbol for alif, when it occurs, in the grammatical construction of a word, with the function of a consonant), is like the initial part of the sound of *a* in father, but without the full intonation being continued, just as if a person should begin to sound the *a*, as it is to be sounded in father, and then stop the vocal effort by compressing the larynx, so as to produce a sort of catch in the throat. This initial sound is sometimes carried on, but always so as to distinguish it, by continuing the breathing after the catch into the sound of the vowel which succeeds hamzá. A person who has been accustomed to hear Arabic spoken will not fail to appreciate the ready clue which Dr. Wallin's system affords to these and other shades of difference with which the Arabic orthoepy abounds. It is, of course, impossible to convey to a person who has no practical idea from experience of the peculiar vocal scheme of a language a correct idea of its pronunciation in the letters of another language. The letters of one language in order to express sounds of another must have a new conventional value first assigned to them, suitable to the new language they are to be used for; and all the systems of transcription hitherto proposed, when it has been left to the student or traveller himself to make out the scheme of pronunciation, by putting his own vernacular value upon the letters used, have utterly failed. Analytically, for literary purposes only, it may be all very well; the letters of the alphabet of one language or of another may then be constituted symbols for the same thing; but half the genius of language is in sound; and it must be satisfactory to all who take an interest in the ethnological aspects under which language presents itself, to acquire a correct knowledge of its living oral form, as

* The notes to this paper, marked W., are by the author; those marked R. by the Rev. G. C. Renouard; and those marked A. by Mr. F. Ayrton.

spoken, as well as of its silent symbols of words, as written; but whoever will be at the trouble of asking a Frenchman who does not know English to read English, or a native of Egypt or of Turkey to read English written in the Arabic character, will be convinced of the justness of the preceding observations. Yet in some works, where orthoepey as well as correct orthography in transcription is aimed at, we are told that the consonants in Arabic, with two or three exceptions, have exactly the same sound as in English, *e. g.*, in 'Sailing Directions for the Red Sea, 1841,' p. 224. The reverse of this proposition is exactly true. This book has, of course, special reference to the names of the Arabian ports in the Red Sea, and it was important to enable navigators and travellers to call them rightly. It is stated in the scheme of pronunciation, p. 225, that the *śād*, *dhād*, and *tā* are merely to be considered as *ss*, *dd*, and *tt*; *s*, *d*, and *t* standing as the representatives of *sin*, *dāl*, and *tā*, respectively. The two sets of sounds are quite distinct with the Arabs, although they may be confounded by the Turks and Persians. *Sin*, *dāl*, and *tā*, are pronounced on the palate, close to the teeth, while their kindred cerebrals *śād*, &c., are pronounced quite at the back of the palate; and the difference in many cases is very marked in pronunciation. (See on these points, and on the hamzā, the Grammars of Caussin de Perceval, Paris, 1833; and of Herbin, Paris, 1803; of Lee, and of De Saey.) Generally speaking, so great is the confusion and inconvenience, for purposes of critical reference, of a mere roman transcription of eastern names and words, that although that mode of transcription alone, from want of typographical facilities, finds a place here, geographical travellers cannot be too sedulous and attentive in procuring of all such names and words as they may have to record, the right and vernacular transcript in the characters of the language to which they belong.

Dr. Wallin's system is as follows. For the Society's vol. 'vi. p. 51 (1836), may be referred to:—

Taking the usual order of the Arabic alphabet,—A, B, T, Th, G, H Kh, D, Dh, R, Z, S, Sh, Š, Ḍ, Ṭ, Ḑh, ', Gh, F, K, L, M, N, W, H, Y.

ā = hamzā.

ā = alif with maddé; or = alif preceded by fath.

ā = yei preceded by fath.

ā or é = hei, or silent tei; preceded by fath in the feminine termination; if the *tei* is to be pronounced, the sign ' is preserved, in order to distinguish it from *tei*, the third letter of the alphabet.

aw = wāw preceded by fath; and which may be pronounced as *ow* in *crowd*, according to the old pronunciation; or as *aw* in *crawl*, according to the modern. (See, but qu. whether not rather as *ow* in *own*?)

oo = wāw preceded by dammā, pronounced exactly, as *oo* in *fool*.

ei = yei preceded by fath, pronounced as *i* in *pike*, or according to the modern pronunciation, as *ei* in *eight*.

i = *y*ei preceded by *kisr*, pronounced as *i* in machine.

y = *y*ei with shaddá' *i. e.* doubled.

a and e = fath.

u = dammá, pronounced as *u* in put.

i = *kisr*, pronounced as *i* in miss; but = *y* as in yet, if preceded by another *i*, or by an *á*, or if followed by an *a* or an *á*.]—A.

I LEFT Káhirá (Káhirah) towards the close of the year 1847, and following the road which leads a little above the town of Suweis* (Súweis), across the tidal flats* at the extreme head of the Gulf of Suweis, and thence along the western shore of the Siná (Siná) peninsula, after a journey of 8 days I arrived at al-Ṭoor (Ṭúr). As al-Ṭoor (Ṭúr) is a port at which vessels navigating this gulf of the Red Sea seldom fail to touch, I had calculated upon readily procuring a passage across from it to some point on the neighbouring coast of Arabia;† but it happened to be the period of return of the Egyptian hāgg‡ (hájj) from Mekká (Mekkah), and I found, in consequence, that any of the usual trading vessels between Egypt and al-Hijáz (Hijáz) which would arrive at al-Ṭoor (Ṭúr) were expected from the south, and that several weeks might elapse before one would leave Suweis bound for the Arabian coast; I therefore determined, after some days' fruitless stay in al-Ṭoor (Ṭúr), to proceed by land along the southern shore of the peninsula, as far as al-Sharm, between which place and Arabia I had been assured by the Bedouins of the neighbourhood of al-Ṭoor that there was a constant communication by sea. I reached al-Sharm in 2½ days, and was then told by the fishermen living there that the Egyptian pilgrim-karawân having been reported to have reached Muweilah on its way home, all the boats belonging to the Bedouins of this coast were on that side of the gulf, excepting one expected from the Egyptian shore, with provisions for the pilgrims. Towards midnight this boat came in; but its master, being afraid of reaching Muweilah too late for the karawân, landed here for a few minutes only, and continued his voyage without my hearing of his arrival before the following morning. Thus, again disappointed, and not feeling inclined to make the long circuit of the Gulf of 'Aḩabá ('Aḩabah), I had no other alternative than to wait for the first returning boat; so resigning myself to necessity, I took up my abode with two Bedouin fishermen of the Muzeiné (Muzeineh) Arabs, on the

* See notes on Suweis and head of the Red Sea at the end of the paper.—A.

† The Siná peninsula is not considered properly a part of Arabia although a land of the Arabs. Niebuhr says (*Description de l'Arabie*, p. 344), "The Arabian name of the country situated towards the north of the Hegáz, between the two arms of the Arabiá Gulf, is called, I believe, 'Barr al-Ṭoor Siná,' the desert of Mount Sinai (or perhaps, more correctly, 'the land of Mount Sinai')."—A.

‡ Pilgrim karawân.—A.

open plain, without even the shelter of a house or tent. The Arabs here give the name of al-Sharm (in the plural al-Shurûm, Shurûm) to the whole tract of coast extending from Râs Muhammed to a point, not very well determined, to the N. of Wâdî Murârî (Wâdî Murârî), nearly in the latitude of Gabal Moosâ* (Jebel Mûsa), in allusion, possibly, to the frequent indentations of the shore line, as Sharm signifies a fissure, and thence a bay or creek in the sea shore. In a stricter sense, they confine the use of the term to a small barren plain of saline crusty sand (Arab, Sabkh, or Sabâkh, Sabâkh), contiguous to the two harbours† which chiefly mark the place. This plain is shut in to the N. by a low range of sandstone hills, and bounded on the S. by the rocky shore. At the foot of the hills there is a well of brackish water. The harbours are formed by the sea shooting up through narrow entrances into two land-locked basins. Of these harbours the western affords good and safe accommodation for the larger class of Arab vessels, and the eastern for the smaller boats of the Bedouins. On the E. side of the former there is a building dedicated to a Muslim saint (Waly), and higher up on the plain, a solitary small stone house, in which, I was told, a man from al-Toor (Tûr) occasionally takes up his residence for the purpose of trading with vessels touching here. Nearly in the centre of the plain, between the two harbours, grows a solitary date-tree, under the scanty shade of which small parties of Bedouins or of Arab boatmen may be sometimes seen preparing their frugal meal, or indulging in a short repose during the noonday heat. On account of its fresh water, and the security of its harbours, al-Sharm is much frequented, and vessels usually endeavour to make it their place of night-anchorage, especially when bound northwards.

As soon as a vessel is descried in the offing, one of the fishermen established here carries the news to his brethren of the Muzeinê (Muzeineh) tribe, who are generally encamped in the Wâdî al 'Aât (Wâdî-l-'Aât), at a distance of about 5 h. from the coast. On receipt of the intelligence, some of the tribe forthwith repair on their camels to al-Sharm, in order, as they say, to "go down and see what God has sent them." Besides a small contribution exacted from every vessel anchoring here, and generally paid in grain or rice, the Bedouins hope to find on board pilgrims or other passengers, who, tired of a sea voyage which may have lasted 40 or 50 days, can be induced to hire their camels and

* According to a memorandum by Captain Moresby (whose hydrographical labours in the Red Sea are an honour to this country), in the traveller's book at the convent of Mount Sinai, under date the 14th of February, 1830, the latitude of the summit of Mount Sinai (Gabal Moosâ) is $28^{\circ} 32' 50''$ N.—A.

† For a further account of these harbours see "Wellsted's Observations, Journal of the Royal Geographical Society," vol. vi. (1836), p. 51.—A.

continue the journey to Suweis (Suweis) or to Kâhirâ (Kâhireh) by land. The fishermen inhabiting the port are poor men, of Bedoon origin, who, having lost their flocks and camels by some of the various accidents to which the nomadic life exposes them, have been obliged to give up the desert and resort to the sea for subsistence. They depend almost exclusively upon fish for their sustenance; and their only chances of varying their fare are when they are rewarded for their trips to Wâdî-al-'Aât (Wâdî-l-'Aât) with corn or flour by their Muzeiné (Muzeinah) kindred, or when they can exchange their fish with the people of the boats visiting them, for bread and rice. Their fishing apparatus is the hook and line. They manufacture their hooks themselves out of a nail or other scrap of iron they may happen to possess, and obtain their lines by barter from the passing boatmen; but the abundance of fish in the adjacent sea, and their own skill in catching them, make up in a great measure for their want of better tackle.

Many of their nomadic brethren of the Sînâ (Sínâ) Mountains and of the Heteim (Heteim)* tribe, some families of which had this year passed over to the opposite island of Teirân (Teirân), also possess boats, in which they carry on a small trade between the peninsula and the coasts of Arabia and Egypt; the latter shore they know only as the Barr-al-'Agam† ('Agam), a name probably applied by the Arabs to Egypt, from their considering it as the land of a people not of Arabian origin, and therefore barbarous as compared with themselves. From the Egyptian shore they bring wheat and millet, dhoorâ ‡ (dhúrah), partly for satisfying the wants of their own families, but principally for supplying the small towns and the Bedoons along the Arabian coast as far down as Al-Wegh (Wejh), beyond which they seldom pass southwards.

At the season of the Egyptian karawâns to and from Mekká (Mekkah), their trade becomes very active in the places where the karawân is accustomed to halt for the night, or for a few days; they then attend at such places with provisions of all kinds, and take in exchange for them coffee, spices, clothing, weapons, or whatever else the pilgrims may have to part with. It was with a view of profiting by this sort of traffic that the Bedoons of the Peninsula had now gone over in their boats, as I have already mentioned, to meet the returning karawân at Muweilah.

Six days had I tarried here in the company of the ten Bedoon fishermen—some quite naked, others in rags—forming the whole

* Hetym in Burekhardt. Notes on the Bedoons, vol. ii. p. 386 (14).—A.

† That is, the foreign land; 'Agam has the signification of the Latin word "barbarus," and in a collective sense "foreigners, or whoever are not Arabs."—A.

‡ Sorghum saccharatum, or vulgare.—R.

population of Al-Sharm, when the first boat returned from the Arabian side; it belonged to a Bedoon of the Beni 'Ukbá (Bení 'Ukbah), who, for some years, had been living with the Muzeiné (Muzeineh) Arabs in the Síná mountains. As soon as he landed he drew up his small bark on the beach and began to dismantle it, with the intention of leaving it in the care of the fishermen, and going himself to visit his family in the Wádi-al-'Aât (Wádi-l-'Aât). After much persuasion, and the offer of a comparatively large fare, I prevailed on him to launch his boat again, and return with me to Muweilah (Muweilah), which he had just left. We set sail on the same evening, and passed the island of Teirân during the night. On the following morning we were overtaken at sea by a heavy squall from the west, which compelled us to seek shelter under the island of Shooshwé (Shúshweh), in an unsafe anchorage between coral reefs, where we remained for some hours, when the wind suddenly veered round to N.N.W., and partially laid the heavy sea. We then left our place of refuge and fetched the island of Barakân, where we passed the night. On the following day we continued our voyage by the small island of Yaboo'a (Yabú'a) and arrived at Muweilah about noon.

Muweilah is dependent upon the Egyptian government, and is one of the more important of the places on the road of the Egyptian pilgrims to Al-Higaz (Hijaz). Like other principal stations on the pilgrim karawân routes, it contains a castle (arab. kal'a) and a few stone houses. The castle of Muweilah is garrisoned by Egyptian troops, and the houses are tenanted by the officers and dependents of the garrison. The remaining inhabitants, who are small traders and members of reduced Bedoon (Bedowin) families, content themselves with temporary huts called bakkâr (bakkâr)—pl. bakâkîr (bakâkîr), made of the branches and covered with the leaves of the date-palm. The garrison may be estimated at forty persons, and the other inhabitants at from seventy to eighty families.

The castles on this and the Syrian pilgrim-route are nearly all similar in construction, although differing in size; they were probably built by the Turkish Sultâns for the protection and supply of the pilgrims, and to guard the wells which they generally inclose, and also to defend the inhabitants of the town around their walls against the incursions of predatory parties of Bedoons. But the spirit and boldness of the Arabs having been much repressed by the late Pâshâs, the Turkish government in its indolence has neglected to repair these castles, and although originally strong and easily defensible, they are now falling rapidly into decay.

The Bedoons, who only resort to Muweilah as a place of longer or shorter provisional abode, and dwell in the before-mentioned

huts or bakâkir, or in their own tents brought with them, are poor individuals and families whom unprosperous circumstances have forced to leave, for a time, the desert, to which they generally return as soon as they can. A few of them, however, become so far attached to living in a town as to settle here permanently; those who can command the means, then compete with the people of the castle, and others from Egypt, and with passing merchants, in the trade they all carry on with the Bedooins of the surrounding country, and with the nearer places on both sides of the Red Sea. Thus Muweilah is of considerable importance to the neighbouring Bedooins, as being the nearest, and often the only place where they can obtain their supplies in exchange for their flocks and milk; or, these last failing, sometimes on credit, as happened in the case of one of the chief clans of the Ma'âzé (Ma'âzeh) tribe, which, during my stay here, was supplied by the steward of the castle, on account of the Egyptian government, with rice and corn on credit, to the amount of 1500 Spanish dollars.

There is no anchorage at Muweilah, except in an insecure roadstead, behind coral reefs, which are at some distance from the shore; and it is consequently seldom visited by larger vessels than those sent by the Egyptian government with the provisions for the castle from Koscir, and supplies generally are much dearer here than at al-Wegh (Wejh); on account of this, and from a fancied superiority in the hardness and quality of the Syrian grain, the Bedooins prefer getting their supplies from Ghazzé (Gaza), if the state of warfare in the desert and the difficulty of finding pasturage do not prevent them from going so far. Many of the inhabitants of Muweilah have gardens and plantations of date-trees, larger and better cultivated than those in other places along this road to Mekká (Mekkah). Water at Muweilah, though not always good, is abundantly supplied by numerous shallow wells in and around the town. Springs, yielding a tepid and brackish water, occur along the whole of this coast, at a slight depth below the surface of the ground, even close to the high watermark. At Muweilah, and, to some extent, throughout the north-western part of Arabia, rain falls at intervals from October to April. During the remaining months the weather is hot and dry.

As every village and town in Arabia is considered by the Arabs as belonging to some particular tribe, Muweilah is claimed by the Beni 'Ukbá ('Ukbah), who are usually encamped in its neighbourhood; they are called the sentinels* of the place, and claim a right of preference to other tribes for the escort and conveyance of the pilgrims between Bedá (Beda), some hours south of 'Aḳabá, and Dhobá (Dhoba), known also by the name of Bîr Sultân,

* Ghufarâ, or more correctly Khufarâ.—W. Protectors?—R.

(Biru-I-Sultán), which two places are considered as marking the boundaries of the land of the Bení 'Ukbá (Bení 'Ukbah).

The Bedooins here, as in the other places under the Egyptian government, although the rightful Arabian inhabitants of the town, have no share in the administration of its affairs; while, in the towns on the Syrian road, their full rights have been preserved to them. There also, as throughout the greater part of Arabia, the primitive and time-sanctioned nomadic laws and customs of the desert are observed; but here the system of Islam jurisprudence* is established and administered by Turkish officers.

Finding no mention made of Muweilah † in the Arabic manuscripts which I have been able to consult, nor any traces or traditions among the existing generation in the land, pointing to a high antiquity, I am inclined to consider it as a town of modern origin, owing its existence to the circumstance of its site being on the route of the Egyptian pilgrim karawâns.

The Bení 'Ukbá pretend to have been, in ancient times, a great and powerful tribe, possessing all the land from Shâmâ (Shamá) to Dâmâ (Damá), the former of which names signifies the Syrian desert, and the latter a valley, still so called, lying between Dhobá and Iṣṭabl 'Antar. At the commencement of Islâm (Islám) they say the tribe was divided into two large subdivisions, the Musâlimé (Musálimeh) and the Bení 'Amr ('Amru), both derived from a common ancestor, named Ma'roof (Ma'rúf). Domestic feuds between the sheikh of the Bení, 'Amr ('Amru), and his wife 'Ayeifá ('Ayeifah), sister of 'Aly, the son of al-Negdî (Nejdi), the chief of the other clan, arose, which terminated in the expulsion of the Bení 'Amr (Bení Amru) by the Musâlimé (Musálimeh) from the neighbourhood of Muweilah, and their being compelled to seek refuge with the Hegâiâ (Hejáyá) tribe, about Tafilé (Ṭafileh), with whom they have ever since formed one tribe; but they still retain their animosity towards their kindred clan of al-Musâlimé (Musálimeh). Other clans and families of this formerly numerous tribe have passed over into the north of Africa; others, again, have mixed with the Egyptian fellâhs, till the Bení 'Ukbá of the present day have dwindled down to about forty or fifty tents in the neighbourhood of Muweilah. The more distant and northerly parts of the country, originally occupied by them, have been appropriated by the modern and adventitious but ever increasing tribe of Huweitât.

In the book of al-Kalkashendy ‡ I find the following notice given

* See Appendix, p. 342.—A.

† Muweilah is the Phœnicum Oppidum of Ptolemy, l. 4, c. 5 (D'Anville).—A.

‡ (Al-Kalkashendy): his book is entitled *Nihâyatu-l-Arab fî ma'rifet kabâili-l-'Arab*. The scope of what is necessary for a knowledge of the Arab tribes.—No. 7353 of the Brit. Mus. MSS. A.

of this tribe: "Benoo 'Ukbá (Bení 'Ukbah) are descendants of Gudhâm of the Kahtâniyé (Kahtâniyeh)." Al-Hamdâny (Hamdâni) says: "they are the sons of 'Ukbá ('Ukbah), son of Maghrabé, son of Herâm (Herâm)." The author of Al-'Ibar says: "their land extends from al-Karak to al-Azlam, in al-Higâz (Hijâz), and they are bound to secure the road between Egypt and Medinâ (Medīnah), and as far as Ghazzé (Ghazze), in Syria." The author of Al-Mesâliku-l-Absâr* says: "it is incumbent upon them to conduct the Egyptian pilgrims from al-'Aḡabâ ('Aḡabah) to Al-Dâmâ (al-Dāmā)." The same author continues, "and of them are the Benoo Wâsil al-'Ukbá, i. e. the children of Wâsil, son of 'Ukbá in al-Higâz (Hijâz)." The author of al-'Ibar says likewise, "and in Afrikiyâ (Afrikīyah), in the west (al-maghrib), there are (some) of them, as well as in the neighbourhood of Terâbloos (Terabulús, Tripoli, in Africa)." The same author mentions "the Bení Wâsil (Bení Wâsil), whose abodes are in Egypt, as a branch of the Benoo 'Ukbá,† son of Maghrabé, son of Gudhâm, of the Kahtâniyé;" and al-Hamdâni is reported to say, that a "part of them live in Agâ (Ajá) and Selma (Selma), the two mountains of Tay. The only place in which I met with the Bení Wâsil was in al-Sharm of the Sinâ peninsula, where two of the fishermen I have mentioned said that they belonged to that tribe, and used to entertain me with stories of the former grandeur of their ancestors. In the mountains of Tay, in Gabal (Jabal) Shanmar, I did not happen to hear of them.

The land in this part of Arabia, between the sea and the chain of granitic mountains which runs parallel with the coast, at an average distance of 8 hours on foot (24 miles) from the beach, is known by the general name of Al-Sâhil (Sâhil—the shore), and, excepting on the mere beach, the whole is intersected by valleys running down from the main chain in a south-westerly direction. One of the largest of these valleys is named Wâdī Surr (Wâdī Surr), and extends from Gabal Shâr (Jabal Shâr) of the main range, to Muweilah. It contains a copious well from which the inhabitants derive their supply of drinking water. Another of these valleys, about 6 hours (18 miles) N. of Muweilah, is called Wâdī Tiriam (Wâdī Tiryam); in it are situated the wells known as al-Uyoon (al-'Uyûn—i. e., the Springs), where the pilgrims pass their first night after leaving Muweilah, on their way to Egypt. To the S., between Dhobâ (Dhoba) and Iṣṭabl 'Antar,‡ is Wâdī Dâmâ (Wâdī Dāmā); and, nearer (query to the S. of Iṣṭabl 'Antar?) to Wejh (Wejh), Wâdī Ferâ' (Wâdī Ferâ'), and Wâdī Azlam. All these valleys, however, as well as the smaller ones contiguous to the foot of the chain, are rather open

* The ways of sight.—A.

† Bení 'Ukbah.—R.

‡ The stable of 'Antar.—R.

undulating plains of soft sand, than narrow, well-defined depressions, separated by distinct lines of hills. The mountain chain, which I have described as shutting in as-Sâhil (as-Sâhil) on its eastern side, is called, in its course from opposite to al-Wegh (Wejh) to Wâdi Lithm, a cross valley opening through the chain at about 8 hours (24 miles) N. of 'Akabâ ('Akabah), by the general name of Gibâl al-Shafââ (Jibâlu-sh-Shefâ) or Gibâl al-Tahamâ (Jibâlu-t-tahamah). Its continuation N. of Wâdi Lithm until it joins the mountains of Syria, takes the name of Gibâl al-Sherâû* (Gibâlu-sh-shirâ). The highest peaks of the chain about Muweilah are Gabal Shâr (Jabal Shâr), already mentioned, and, N. of it, Umm Gudeilê (Judeileh), and Gimm (Jimm), and Šadr, and Harb. The soil of as-Sâhil is generally poor, affording only a scanty pasture, but it produces in abundance the acacias called Samur† and Seyâl‡. The former yields a gum inferior in quality to that of al-Higâz (Hijâz), and the latter plenty of wood for burning into charcoal. The Bedooins dispose of these articles at Muweilah, or at Suweis, and sometimes even in Kâhirâ (Kâhirah).

Besides the Benî 'Ukbâ (Benî 'Ukbah) Bedooins in the immediate neighbourhood of Muweilah, this land is almost everywhere inhabited by the Huweitât Arabs, one of the largest tribes of the day, and spreading from above Petra, or Wâdi Moosâ (Wâdi Mûsâ), along the coast to al-Wegh (Wejh), and partly into the mountains on the E., and occupying also many districts in Egypt. They are looked down upon by other tribes as mixed Bedooins sprung from fellâhs (husbandmen), not of pure nomadic origin, and are held as on a par with the despised tribe of Heteim, nicknamed Nutât-al-heit (Nutatu-l-heit)—or "the Wall-climbers." The principal Huweitât clans dwelling in this land are, Dakikât (Dakikât), 'Umrât ('Umrât), 'Umrân, and Tahikât (Tahikât),—the last regarded by some as the noblest clan of the tribe, by others as a separate tribe—and who usually rove in and about Wâdi Tiriam (Wâdi Tiryam), and up as far as 'Akabâ ('Akabah); 'Ubeyât ('Ubeyât), Gerâfin (Jerâfin), Suleimîn (Suleimîn), Musâlimê (Musâlimeh), 'Ureinât ('Ureinât), Sughayîn (Sughayîn), and Sharmân, who frequent the districts S. of Muweilah and towards Iṣṭabl 'Antar; and Meshâhîr (Meshâhîr), and Kor'ân (Kor'ân), who confine themselves to Wâdi Azlam, at the base of Gabal

* I have given the orthography and pronunciation of these names as exclusively prevailing among the present Bedooins; but Arabian geographical writers sometimes designate the whole of the chain by the name of al-Sharââ.—W. Also Sarâh.—A.

† Inga Unguis. Forskâl. Flor. Arab. p. cxliii.—R.

‡ Acacia Seyal. Cailland, Voyage à Meroë, vol. iv. p. 310; Descrip. de l'Eg., tom. xviii. p. 111, No. 265; Forskâl Fl. Arab. p. cxxiv. The wood of this tree affords the best kind of charcoal for fuel.—A.

Suweyid, and the district about al-Wegh (Wejh). The Huweitat give the name of Reishy (Reīshī) to the ancestor of their tribe, but in the Arab genealogies which I had an opportunity of seeing I could not find any notice, at least any direct notice, either of him or of his descendants.

Besides the Huweitat, there is also a small tribe called al-Messā'id (al-Messā'id), who represent themselves as having originally come from a valley named Wādī Līf, in al-Yaman: they usually reside in the vicinity of Maḡnā,* a place consisting of an assemblage, as I was told, of date-tree huts (bakkār) two days S. of Aḡabā ('Aḡabah).

Extensive date plantations, belonging to the Benī 'Uḡbā (Benī 'Uḡbah), and other Bedouins of the surrounding country, are cultivated at Maḡnā, along a stream of running water, by a tribe of nomadic fellāḥs, called al-Fawāidē (Fawāydeh), who, in the same manner as the Gabaliyé (Jabaliyeh) in the Sīnā mountains, associate themselves with the Bedouin owners of the plantations, and receive for their labour and care in cultivating them a certain proportion of the dates annually produced. At the season when the fruit is ripe the owners assemble here to gather their respective crops; and, as at the same time a sort of fair is going on, the prospect of trading and bargaining seldom fails to attract from remoter districts many Arabs who have no interest in the plantations.

On the 20th of February, 1848, I left Muweilah in company with a man of the Benī 'Uḡbā tribe. Our way lay over the sterile, sandy plain of the shore, nearly along the pilgrim road, for one hour, when we entered a flat valley bearing slight vegetation, called al-Ḳāmīrah (Ḳāmīrah). Half an hour afterwards low sandstone hills, or rather irregular hillocks, and masses of conglomerate, such as are usually found at the foot of a chain of mountains, commenced. We continued our course towards the N.E., through gently ascending valleys between hills of similar character, but somewhat darker in colour, and becoming gradually higher, until we arrived at the tents of my guide and his clan, after a journey of 6 hours from Muweilah. 1848.
Feb. 20.

On the 21st we resumed our journey in the company of the whole clan, the members of which had decided upon moving from the place they occupied on the previous day. Passing through a small valley called Weiwi (Weiwi), we entered a larger one, the Wādī Ṣadr, which, formed by the accession of various ravines and smaller valleys running down from between the peaks of the main chain, gradually expands into an open plain along its foot. The ravines in the mountains are steep and rugged, but afford plenty of water and contain some date-trees, which belong to the Feb. 21.

* Spelt Maḡnā in Captain Moresby's Chart of the Red Sea.—A.

Beni 'Ukbá. The soil of the plain is that clean, soft sand called *nufood* (*nufúdh*), and which an Arab never ceases to look upon with predilection, from its constituting, in his idea, the proper element of his own and his forefathers' land. Wádi Šadr, being also one of the most fertile spots in as-Sāhil, is a favourite dwelling-place with the Arabs here; and, as soon as we came in sight of its yellow plain, all the women of the clan exclaimed with evident delight, "God be praised that we see the *nufood* again." We crossed the plain of Šadr in a N.N.E. direction, towards the peak of Gabal Harb; but, as we readily accepted the friendly invitations proffered to us from the tents we continually passed on our way, we were a good deal delayed, and the sun had set upon us before we reached the mountain, after an actual time of march from Weiwi of 3 hours. We were welcomed with coffee and supper by the Huweiti branch of the 'Umeirát ('Umeirát), although, only two days before, they had been plundered by a hostile clan of the Ma'ázé (Ma'ázeh). As is often the case, in the spring, with the poorer Bedouins in Arabia, our hosts had no tents to shelter us from a strong and cold S.E. wind which swept with violence down Gabal Harb. This wind, I was told, blows here at regular intervals of about seven days. It rises after sunset, and continues during the night, but is succeeded in the day-time by a southerly breeze. It is quite a local wind, seldom extending beyond the land at the foot of the chain, and rarely reaching the sea.

1848.
Feb. 22. On the 22nd we continued our way for a short distance through Wádi Šadr, along the foot of Gabal Harb, the high and steep flank of which turns here at an oblique angle to the E.N.E., and gives rise to a wide opening through the main chain. After a march of 1 h. 10 m. we began to penetrate the rugged defiles of the interior of the chain. The first valley we entered was called al-Kahalé (Kahaleh), and took 1 h. 20 m. to pass. Its further continuation to the N.E. assumes the name of al-Huleiká. It led us, after another 2 h. 20 m., to a defile called Nakb* al-Huleiká (Nakbu-l-Huleikah). In 1 h. 20 m. more we had passed the summit of the defile and descended into an open, circular plain called al-Suweiká (Suweikah).

Feb. 25. On the 25th we crossed the Wádi Suweiká in $\frac{1}{2}$ h. to a lower range of hills on its S.S.E. border, and entered another valley called al-Mureihá (Mureihah), which we traversed in 1 h. 45 m. From that place a march of 1 h. 10 m. through a pass called Deikát† al-Sa'loul (Dhaikatu-s-Sa'lúl) brought us to Wádi Sāwāwin (Sawāwin), a more regularly defined valley sloping rapidly to the W.S.W. Our course to-day had been invariably S.S.E.,

* Anglicè, a mountain path.—A.

† Anglicè, a narrow pass or strait.—A.

but, from this place, we turned again to the N.E., and following a difficult track along the bottom of the valley, which is much encumbered with huge stones and detritus from the adjacent rocks, passed the night in the tents of the Tugarâ (Tujarâ) Bedouins of the Ma'âzé (Ma'âzeh) tribe.

On the 26th we continued our way for 2½ h. up this valley to its head, at Naḵb al-Sawâwîn (Naḵbu-s-Sawâwîn), a very steep defile, which we were 1 h. in ascending. 1848.
Feb. 26.

As the summit level we had now reached is on the ridge which separates the valleys and winter torrents running towards the Red Sea from those taking the opposite direction towards the interior of the desert, these heights form the natural barrier between two distinct portions of Arabia; I will therefore here make a few observations on the tract we had lately traversed.

Being in the interior part of a mountain range, it consists of precipitous hills and valleys irregularly succeeding each other, having sometimes a surface of naked rock, at others of loose sand; with a vegetation similar to that of the Sâhil, but in which trees abound more than shrubs and herbage. The valleys are covered with stones and rubbish derived from the disintegrating rocks of the range; and the whole presents a gloomy, desolate aspect of ruin and devastation. The mountains of the chain on the coast side are exclusively granitic; but further eastward, in the interior of the chain, dark brown sandstone succeeds. Excepting a few date and almond trees in certain parts of the mountains, the tree most generally seen is the acacia.

All this land, commencing at the brow of the mountains towards the shore, and extending over the hilly tract of the interior of the chain, is called al-Tâhāmâ.* I have not found any direct notice of the tract in Arabic works, except in the *Ḳâmoos* (*Ḳâmûs*) of Firôzabâdî, where al-Tâhāmâ is stated to signify "the land sloping towards the sea," and is distinguished from the low land called al-Tihâmâ (Tihâmah), which, by most of the Arabian geographers, is assumed to be the southern part of al-Higâz. It is well known that the lines of demarcation, by which the Arabian geographers define the limits of the different portions of Arabia, are discrepant and vague, and in many instances at variance with the boundaries assigned to them at the present day. Thus, for instance, according to the opinion of al-Madâ'îny (adopted also by M. Caussin de Perceval, in his late excellent work, '*Essai sur l'Histoire des Arabes avant l'Islamisme*'), al-Higâz (*Higâz*) is a general name for the whole of the mountain chain which extends from Yaman (Yemen), along the coast of the Red Sea, up to Syria; and, according to al-Wâḳidy (*Wâḳidî*), only for the

* Invariably so spelt and pronounced by the present inhabitants.—W.

land between al-Medīnā (Medīnah) and Tebook (Tebūk). Ibn Ayās gives to the chain the name of Sherā (Sherā) through its whole extent; and I was myself told by a Bedoon from Tāif (Tāyif), that the inhabitants of that town call Tihāmā (Tihāmā) what other Arabs call Higāz (Hijāz).

The present inhabitants of al-Tāhāmā divide the chain and the mountainous land connected with it into three distinct districts, namely, al-Higāz (Hijāz),* al-Tāhāmā (Tahamah), and al-Sherāā (Sherā). A line drawn from Tāif (Tāyif) to Medīnā (Medīnah) (both of which towns the Arabian geographers generally are agreed upon excluding from al-Higāz (Hijāz)), and thence to Higr (Hijr), may be regarded as the eastern boundary of al-Higāz (Hijāz); and from al-Higr, if the line be continued northwards, along the course of the eastern parts of the Shefā chain, as far as Wādī Lithm, it will mark the eastern limit of the land to which the Bedoons now give the name of al-Tāhāmā (al-Tahamah)—probably in allusion, from the original signification of the word, to the unhealthy and oppressive atmosphere of a low country enclosed by mountains, in opposition to the salubrious air of the open region of Negd* (Nejd). Whether the sea, or the western verge of the mountain chain, is to be considered as the western boundary of the Tāhāmā (Tahamah), is of little consequence; but in the present day, in and about Muweilah, the land along the sea-shore is known by no other name than that of al-Sāhil. From Wādī Lithm to Syria I have never heard the mountains called otherwise than already mentioned,† namely, Gibāl al-Sherāā (Jibālu sh-Shirāh).

Comparing the statements by the Arabian authors with the division of the region by its present inhabitants, I think that al-Higāz (Hijāz), which divides the upper country from the sea,* al-Tihāmā (Tihāmā), which I would identify with al-Tāhāmā*, and al-Sherā—were originally specific names for different parts of this region, and that they have been extended by different authors to the whole of it. Two observations regarding the physical characteristics of Negd (Nejd), and of al-Tihāmā (Tihāmā), and al-Higāz (Hijaz), which some of the Arabian authors have made, seem to me to support this opinion: the one is, that “the valleys of al-Tihāmā (Tihāmā) descend westward towards the sea, and those of Negd (Nejd) eastwards towards the interior;” and the other, which has reference to the flora, that “the land which produces Samur,‡ Talh,§ and Asal|| trees, is

* See note *, p. 307.—A. † See p. 302. ‡ Inga Unguis.—R.

§ *Acacia gummifera*. Caillaud, *Voy. à Meroë*, vol. iv. p. 311; Forskāl, *Flor. Arab.*, p. cxxiv.; *Descrip. de l'Ég.*, tom. xix. p. 111, No. 966.—A.

|| *Species of Acacia*.—A.

Tihāmá (Tihámah), and that where the shrub called Gbađâ grows is Negd (Nejd)." These two assertions, the correctness of which, with a very few exceptions, my own observation of the country, so far as it extended, confirmed, would, in respect of topographical features and vegetation, identify the Sâhil or coast land with al-Higáz (Hijaz) and al-Tāhāmá, in contradistinction to Negd.*

* *Tehāman et Tihāman*.—Hæc Arabia regio ab oceanu Mare Rubrum spectat; partibus cæteris regiones Hegiaz et Yemen: à Mecca usque Aden excurrens, *Tihām* autem æstus vehementia dicitur, unde regioni huic nomen: quia parte potiore depressior solis fervori patet. Dicuntur etiam loca quedam esse *fy Nejdî* Æv *Tihāmâtî-l-Higaz* Æv *al-Yaman*, in *Negd* vel *Tehāma* regionum *Higiaz* vel *Yemen*: sive generali eorundem vocum usu, hoc est, altiore vel humilioris parte: sive quod Tihāma et Negd parte quādam aliis regionibus inseruntur.—Golii, note in *Alfragano*, p. 95.

[*Tehāma and Tihāma*.—This region of Arabia on the west faces the Red Sea; on its remaining sides the regions of Higáz and Yaman; and extends from Mekká as far as 'Aden; *Tihām*, however, signifies intense heat, whence this region has its name; since for the greater part lying low it is exposed to the burning heat of the sun. It is also said of certain places that they are *fy Nejdî* Æv *Tihāmâtî-l-Higazi* Æv *al-Yaman*, in the *Negd* or in the *Tihāmá* of *al-Higáz* or (in the *Negd* or in the *Tihāmá*) of *al-Yaman*; whether it be from the general use of the same words (*Negd* and *Tehāmá*), that is, in the higher or in the lower part (of *al-Higáz* or of *al-Yaman*); or because *Tihāmá* and *Negd* to a certain extent are placed within other regions.]

Niebuhr says, speaking of the *Arđhu-l-Yaman*:—"This country is surrounded by the Arabian Gulf, by al-Hađramawt, by al-Negd, and by al-Higáz. *That part of it which is contiguous to the gulf, and which extends from al-Bābu-l-mandab northwards as far as Hali*, is low, and is called *Tehāmá*. The other part is considerably elevated above the level of the sea, and is called by the Arabs *Gibāl*, that is to say, mountainous."—Description de l'Arabie, p. 160.

And of *al-Higáz*: this province is bounded on the east by al-Negd, on the north by the Arabian Gulf and by the desert of Syria, on the west by the Arabian Gulf, and on the south by al-Yaman, p. 202: and at p. 324, that the town of Hall on the common boundary of Higáz and Yaman is mentioned as in that position by Abu-l-Feidá (circa 1330 A.D.).

Thus Niebuhr asserts the low tract of al-Yaman adjacent to the sea to be called *Tehāmá*; Golius, the corresponding part of al-Higáz; and Dr. Wallin, the low district from the northern boundary of al-Higáz as far as the head of the gulf of 'Akabá: it is also shown that *Tihāmá* in its generic sense means low land as opposed to high land: the word, therefore, is applicable to the whole extent of the low part of Arabia bordering the Red Sea, and beyond that Sea, on the S.E. coast of Yemen, bordering the gulf of 'Aden; at the same time it has, from usage, a more specific and restricted signification in the sense of the low part of each of the provinces into which Arabia is divided along the shore of the seas mentioned. As *Sâhil* merely denotes proximity to the sea—the sea-shore, and therefore may or may not by usage be applicable to the whole breadth of land designated as *Tihāmá*; but the latter must, as is indeed evident from the provinces of al-Hegáz and al-Yaman being said to extend to the sea, include the former.

With respect to the forms of *Tāhāmá* and *Tihāmá*, from the root *tahama*, their grammatical significations coalesce, and they both mean "the lying low and hot." Dr. Wallin has suggested that *Tāhāmá* may be the old word *Tahmá* varied by the modern pronunciation only. For he says that where formerly a guttural was geminated, the modern Arabs lighten the suspension of the voice due to *gezm*, and pronounce the guttural letter as if it were affected by a *fathá*.

As the notes by Golius on al-Yaman, al-Higáz, and al-Negd, in the book cited, will tend to the clearer understanding of what has been just stated, and the book is rather scarce, they are subjoined:—

"(*Arđhu-l-Yaman*).—*Regiones Yemen*.—Arabia, strictè sumpta, dividitur ab ipsa gente in regiones quinque (*al-Yaman*, *al-Higáz*, *al-Tihāmá*, *al-Negd*, et *al-*

Al-Tāhāmā, in that part of it which lies between Muweilah and 'Akabā, is inhabited by various clans of Huweitat and Ma'āzé; the former occupying the lower districts near al-Sāhil, and the latter the more elevated, whence they occasionally pass over to the plains of the interior.

I now resume the course of my route, in which we paused upon the summit of Naḵb al-Sawāwīn (Naḵbu-s-Sawāwīn). From the summit of this pass the land slopes towards the interior of the desert; but both in this and the Sherāā chain the eastern descent is as gentle and insensible as the western is abrupt and rapid, and would be scarcely perceptible but for the direction of the winter torrents. We descended first into a valley called Wādī Rawiān (Wādī Rawiyān), and, following its downward course in an E.S.E. direction for 1 h., turned to our left, and entered the land called al-Hismā (Hismā), a vast plain of the soft and comparatively fertile sand before mentioned,* and of which the Nufood (Nufūdh) desert of Negd (Nejd) for the most part consists. This plain extends, between Ma'ān (Ma'ān) on the N. and Tebook (Tebūk) on the S., from al-Tahamā on the W. to the Syrian pilgrim road on the E.; and continues to the N.E. under various names, with partial interruptions from rocky and stony patches, till it joins the Nufood (Nufudh) lands of Wādī Sirhān (Wādī Sirhān) and the Daḥi or Nufood† (Nufudh) desert. The southern boundary of this plain is formed by the steep front of a lateral chain of hills called Gibal al-Harrā, which branches out at an acute angle from the Shefā chain, opposite to the peak of Gabal Shār (Jabal Shār), and advances in a north-easterly direction till it gradually sinks

Yamūdā sive 'Arood (Yemen, Higiaz, Tehamam, Negid, et Iemamam, sive Aurud), ad quas plerique addunt (*al-Bahreā*) *Bahreā*; licet nonnulli referre malint ad Iracem, i. e. Babyloniam. Regionem Yemen à septentrione terminat (*Negrān*) *Negiran*, inter montes oppidum, quod regiā sede et metropoli (*San'a*) *Sanā* borealius est x ferē dierum itinere, habens latitudinem graduum xix; item aliud (*Hālī*) *Hālī*, non longē à Mari Robro, sub lat. xx grad., et non procul à Mari Persico seu Indico, antiquum emporium Omān, Ptolemæo quoque cognitum."—p. 79.

It should be observed that Hālī is not situated near the Persian Gulf, but on the shore of the Red Sea, in 18° 33' N. lat. by Captain Moresby's chart. *San'a* also is in about 15° 20' N. lat.

"(*Al-Higāz*) *Higiaz*.—Arabie pars inter Tehamam et Negsdam; ita dicta communī ferē scriptorum consensu (*ḥānna ḥagazat beinḥomā*) quod alteram ab alterā *dirimit*; vel, ut alii volunt (*ḥānna ihtigazat bi-l-Gibāl*) quod colligata et constricta montibus; Hagaza enim duo notat; nempe eadem, quæ (*ma'a*) impedire et (*shadd*) *cauldē* constringere. Regionem hanc quoque terminat ab boream Arabia deserta, quam illi (*Bādietu-l-Shām*) *desertum* sive campos *Syriæ* vocant."—p. 98.

"(*Al-Negd*) *Negid* seu *Negd*.—Vox hæc Arabibus terram notat eminentiorem; et peculiariter Arabie partem oppositi solitam Tihame, quæ et (*al-Gheor*) quasi *cucca* dicitur; licet permixta habeat montosa quædam; interjacet autem Negda inter regiones Iemamam, Iemem Higiaz, et Iracem."—p. 94. A.

* See p. 304.

† *Daḥi* is applied to the desert in the sense of its being a place open and exposed to the sun, and, *xxx' ḥayḥā*, to its wide central expanse. *Nufood* seems to be used with reference to the comparative fertility of the part so called.—A.

into irregular hillocks in the neighbourhood of Tebook (Tebúk). From the acute angle—named al-Zawiié* (Zawiyeh)—thus formed between the Shefâa chain and its lateral branch of Harrá (Harrah), the land of al-Hismâ (Hisma) gradually opens out into an extensive plain, over which a few isolated hills are scattered, having among themselves a north-westerly course. They are of the same red coloured sandstone as the Harrá (Harrah) range, and look like outlying masses of its substance. The general aspect and productions of the soil resemble those of Negd (Nejd); although that name is now never applied to this land, but exclusively restricted to the Nufood (Nufudh) region of the interior of Arabia.

Al-Hismâ (Hisma) is, by the author of the Kâmoos† (Kámús), stated to be “a land in the desert, with high mountains, whose elevated crests are generally enveloped in mist.” He must mean by these mountains the bluff parts of the northern front of the Harrá (Harrah) range, which borders this land to the S., and the high peaks of the Shefâa (Shefâ) chain. As for the mist, there was no appearance of any during the few days I remained here, where we constantly enjoyed that serene and lofty sky so peculiar to the desert. The height of the Harrá (Harrah) hills I cannot estimate at more than 500 feet above the level of the plain; but the difference in temperature of this and of the lower country was very sensible. In al-Tahamá (Tahamah) and al-Sâhil (Sahil) the thermometer, at sunrise, varied from 15° to 11°, centigrade (59° to 52° Fahr.); while here it very often, at the same hour, sunk to 7° and 5° (44½° and 41° Fahr.). Dew also fell in the night, which I scarcely ever recollect having observed in Arabia, but only in the deserts near the Nile and on the shore of the Red Sea. It was also, I presume, owing to the partially humid state of the atmosphere, as indicated by the presence of dew, that diseases of the chest, of which I met with instances, sometimes occur here; similar affections being extremely rare in the interior of Arabia.

The nature of the locality and general aspect of al-Hismâ (Hisma) seems to me to answer exactly to the description of those lands which the Arabian geographers designate by the name of Sarwá (pl. Sarâwât), (Sarwah, Sarâwât), although it is not included among them. The ranges of the Shefâa (Shefâ) chain seen from here appear to be lower than the level of this land, which therefore may be said to be “raised above the Tihâmâ‡ (Tihamah).”

* In Arabic zawlié signifies an angle or corner generally.—A.

† The word the author of the Kâmoos uses is *bâliie* [(the) desert], by which he probably means the land called *Badiiet-al-Shâm*, “the desert of Syria.”—W.

‡ Mushrifâ ‘alâ al-Tihâmâ.—W.

The plain of al-Hismà is inhabited almost entirely by the Ma'âzé (Ma'âzeh) and Benî 'Atiyá ('Atiyah) Bedooins, who possess all the land from Birkét al-Mu'adhham (Mu'adhham), the second pilgrim station S. of Tebook (Tebúk), up to Wādī Moosà (Wādī Músa), where they occasionally descend from the mountains, and mingle with their kindred tribe, the Teiâhâ (Tey-âhiâ.) They claim Birkét al-Mu'adhham (Birket al-Mu'adhham), al-Akhdar (Akhḍar), Tebook (Tebúk), Dhât al Hâgg (Dhātu-l-Hâjj), and also in part Ma'an as belonging to them, and levy upon the inhabitants of those places what may be called a small kindred tax (Khâwé, Kháweh), for the protection they profess to afford them against other tribes. Their district of escort (Madrak) of the pilgrims is between Ma'an (Ma'an) and Birkét al-Mu'adhham (Birket al Mu'adhham). Their features and personal character indicate a Syrian extraction, although I have not found any express notice of them to that effect by the Arabian genealogists. The principal clans of their tribe are al-'Atiyât ('Atiyât), consisting of the family and relations of the chief Sheikh, Ibn al-'Atiyá ('Atiyah); Robeilat (Robeilat); Suboot (Subút), or Benî Sebt; Duioofiýé (Dhuyúfiyeh); Tugarâ (Tujará); Soleimât (Soleimât); 'Aliyîn ('Aliyîn); Khadarâ (Khadharâ); 'Amriyîn ('Amriyîn); Sa'dâniyîn (Sa'adâniyîn). Of these clans, the only one I have found mentioned in the Arabian genealogies is the Suboot (Subút), which may probably be the same as the Suboot (Subút) stated by al-Kalkashendy to be "derived from Lebîd (Lebîd), of Soleim (Soleim), (perhaps Salim), of the 'Adnâniyé ('Adnâniyeh), dwelling in the land of al-Barká (Barkah)." Ma'âzé (Ma'âzeh) Arabs are spread over all Egypt, and it may be presumed that thence, following the high way trodden for centuries by nomadic emigrants from Arabia, they passed over into the north of Africa with the view of again taking up their original desert habits, which they must have partially abandoned during a half settled fellâh life in the valley of the Nile.

The Suboot (Subút) have been, on account of their name* and peculiar rites ascribed to them by some European travellers, supposed to be of Jewish origin and to be still attached to Judaism; I therefore particularly observed their customs, and questioned them about their origin. With regard to the name of their clan they uniformly derived it from that of one of their ancestors called Subeitân, a name still much used amongst the Bedooins; and in their mode of life and habits I could find no peculiarity distinguishing them from other neighbouring tribes, except a custom I did not elsewhere see in the desert, of ringing a large bell, sus-

* سبوت (suboot), a plural of سبت (sabt), the sabbath.

pended on the middle pole of the tent at the time of sunset, when the camels and flocks return from pasture. This custom was observed every evening, throughout the tribe, in the tents of the sheikhs and others whose means enabled them to possess a bell; but upon my inquiring its meaning, I could get no other information than that it was an old custom with them thus to hail the return of the camels and the mystic hour of descending night.

There are not, as far as I could learn amongst the nomadic Bedooins, nor in the towns or villages in the interior of Arabia, persons professing any other religion than the Islâm; nor did I ever hear, in those parts of Arabia which I visited, mention made of tribes or of individuals suspected to be attached in secret to another creed. The reason of this does not seem to lie in the bigotry of the inhabitants, whom I have always found to be more tolerant than other Muslims; but, probably, in the exact conformity of the Islâm to the circumstances of the country in which it originated, and in the absolute poverty of the desert tending to discourage immigration, and, perhaps also, in the extreme simplicity of life among the Bedooins disinclining the more refined inhabitants of the surrounding countries to seek intercourse with them.

Like most of the tribes which were not forced to adopt the reformed doctrines of the Wahnâbiyê (Wahnâbiyeh) sect during the period of its ascendant power in Arabia, the Ma'âzé (Ma'âzeh) are, in general, grossly ignorant in the religion they profess, and I scarcely remember ever meeting with a single individual of the tribe who observed any of the rites of Islâm whatever, or possessed the least notion of its fundamental and leading dogmas; while the reverse might, to a certain degree, be said of those Bedooins who are, or formerly were, Wahnâbiyê (Wahnâbiyeh).

After passing some days in the tent of the chief sheikh, Ibn 'Atiyâ ('Atiyah), I left the tribe in company with two Bedooins. We started from al-Zâwüé (Zawiyeh), where, after an almost daily change of ground since I had been with them, their tents were then pitched, and following the side of the Harrâ (Harrah) range, with a N.N.E. course, arrived, in 8 h., at Wâdî 'Uweinid (Wâdî 'Uweïnîd), a ravine resembling the dry bed of a torrent, and descending from the higher part of the range, in a N.N.W. direction, between hillocks and ridges covered with loose sand, upon the plain of al-Hismâ (Hisma). This ravine has a well of tolerably good water, and much herbage and brushwood. On its northern border is the burying place of the Ma'âzé (Ma'âzeh) tribe, where, from ancient times, their sheikhs and other persons of consideration have been customarily buried. Its entrance towards al-Hismâ (Hisma) is filled with immense stones, which appear to

have been detached and rolled down from the overhanging mountains. Upon some of these stones are graven clumsy representations of various animals, such as camels, sheep, and dogs, and on others, inscriptions in ill-formed characters, now nearly all effaced by the action of the weather on this crumbling sandstone. Although I am unable to form a decisive opinion upon these inscriptions, and am inclined, from their rudeness, to regard them only as the work of Bedoon shepherds, such as I have seen in other parts of the desert, I transcribed a few of them, of which a copy is given in the annexed plate. Except on the three stones from which the specimens were taken, I noticed none containing anything like connected symbols; but the impatience of my Bedoon companions left me so little time that I could not stroll far in quest of others which may possibly exist.

Leaving Wâdi 'Uweinid to our right, we advanced in an easterly direction, over hilly ground, for 1 h., and then entered a narrow pass between two perpendicular cliffs, which in $\frac{1}{2}$ an hour led us out upon the plain of al-Bakkâr (Bakḳâr), bounded on the W. by the last parts of the Harrá (Harrah) range, and on the E. joining the plain of Hamâdet Tebook (Hamâdet Tebûk). From the commencement of the plain al-Bakkâr (Bakḳâr), at the eastern end of the pass, to Tebook (Tebûk), I reckoned 5 h. over a complete unbroken level. The distance between Muweilah and Tebook (Tebûk) is generally accounted 4 days' journey with laden camels, which agrees with the time I took. But were it not for the windings and badness of the road in al-Tahamá (Tahamah), the direct distance pointed out to me as E. by N. would not exceed 3 days.

Tebook (Tebûk) is a village of about sixty houses, on the high-road of the Syrian pilgrims, 4 days from Ma'an (Ma'ân), and the same number from Higr (Hijr). It is situated in the centre of a large plain, called Hamâdet Tebook (Hamâdet Tebûk), in the tract of Arabia lying between the Shefâa chain and its northerly continuation Sherâa, on the west, and the ranges of the Nufûd (Nufûdh) high lands of Negd (Nejd), on the east. The Arabian geographers differ much as to the region of Arabia to which this tract belongs, some referring it to Syria, others to al-Higâz (Hijaz), and others to Negd (Nejd). Its present inhabitants, however, indisposed as they are by mental habit to generalise, neither give to the whole tract a generic name, nor consider it as part of any one of the three regions mentioned, but denote by a specific name each separate part of it. That part of it forming the plain of Hamâdet Tebook (Hamâdet Tebûk) extends about 5 h. on every side of the village; but, from its great expanse and the absence of any considerable hills, its boundaries are uncertain,

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and not clearly marked. Its soil is the hard gravelly ground called by the Bedooins "gālādé" (jaladeh), and is for the most part quite barren. It is watered, according to the report of the Bedooins, by ninety streams, descending in winter from al-Hismā (Hismi) through as many valleys. Around the slight eminence upon which the village is built there are a number of wells, of moderate depth; in addition to these, the village itself contains a copious spring, the water from which is conveyed through some small gardens and date-plantations belonging to the inhabitants. Grain is occasionally sown on the open land, but the produce being insufficient, the inhabitants are obliged to obtain a supply from Muweilah, or from Syria, which they prefer, as before remarked,* notwithstanding the greater distance of the latter place. The people of Tebook seemed poorer than those of any other village that I visited in this part of my journey. Their food in spring consists almost exclusively of herbs gathered in the neighbouring desert by the women, and eaten raw, or merely boiled in water, without anything more substantial in addition.

The inhabitants of Tebook (Tebúk) call themselves Humeidât, and trace back their pedigree to the Beni Ka'b (Beni Ka'b), near al-Baṣrá (Baṣrah); stating their ancestors to have been of that tribe, and the first possessors of the spring of Tebook (Tebúk). They are, however, like the people of most of the desert villages, a mixed race, derived from aliens as well as from a nomade stock, or from both. Of the aliens, some have emigrated from their native country under fortuitous circumstances, and others, as frequently happens, have been left behind by the pilgrim karawāns, and eventually settled here; these last, in this part of Arabia, being chiefly of Syrian origin. The rest, which constitute by far the greatest number, are emancipated slaves and their progeny, known as Mutawallidin, and found throughout Arabia. Not only are whole villages filled with them, as al-Rihâ (Jericho), and many parts of al-Gawf (Jauf), and Sook al-Sheikh (Sûku l-Sheikh), &c.; but they even form large clans among the nomadic Arabs, leading the same pastoral and predatory life as their former masters, to whom, although freed, they generally remain attached from a feeling of respect and gratitude. Amongst the Bedooins they are only allowed to intermarry with their own race, for a genuine Arab will seldom, if ever, condescend to take a black, or Habashiye (Abessinian) woman for a wife: and the race of these Mutawallidin in the nomade tents remains unaltered through generations. But with the people settled in fixed abodes the feeling in favour of propagating a pure race is not so strong, and the Mutawallidin in the towns and villages mix and intermarry with

* See p. 295.

Arabs, and children are produced in whose features it is often quite impossible to recognize the African type. In al-Gawf (Jaúf), for instance, I knew an old woman of genuine negro blood, who, by a husband of her own race, had borne perfect negro children, while by another, a native Arab, she had a family who were fair, with true Arab features.

The Mutawallidín may be said generally to be more industrious than the Bedooins; or, at least, their pride is not so great as to make an agricultural or a laborious life humiliating to them: for that reason, and from their want of the strength and courage of the Arabs to undergo the hardships of the desert, they prefer a residence in the villages, where they arrange with the Bedooins for the care of their date-plantations, or contrive to gain a livelihood in some other way. As, however, they are subjected to heavy exactions by their masters, who despise them, and are perhaps unthrifty themselves, they seldom attain wealth and prosperity. The price of slaves being very low in al-Higâz (Hijáz), the towns and villages there are full of them; and I was told that the greater part of the large and fruitful date-plantations in Kheibar, belonging principally to the Fukarâ (Fukarâ) Bedooins of the 'Anezhé ('Anezh) tribe, are kept and cultivated by Mutawallidín. In Tebook (Tebúk) nearly a third part of the population consists of them; and their general employment there, as well as that of the other inhabitants, is the cultivation of gardens and trading with the Bedooins and pilgrims, who usually halt there for one or two days on their road to and from Mekká.

Tebook, like most Arab communities, is governed more by traditional laws and customs than by the regular Mohammedan Code;* and though the people generally show great reverence for the rites and precepts of their religion, and are better acquainted with its doctrines than the Bedooins, they prefer the more liberal law of the latter, as better suited to their way of life. The posts of sheikh and 'akid, invested with the highest civil and military authority in every tribe, are here, as among the Bedooins, hereditary. These chiefs in free consultation with the oldest and wisest, or, as it frequently happens, with the whole of the population, regulate the affairs of the village, and settle all disputes and disagreements between its inhabitants and the neighbouring Bedooins. The people of this place are not, as in those dependent on the Egyptian government, subjected, in the management of their concerns, to the interference of the Turks quartered in the small castle in their village. The castle, although having the outward appearance of a stronghold meant to ward off sudden attacks of hostile tribes, may rather be considered as a storehouse for the

* See Appendix, p. 342.

accommodation of the pilgrims and the soldiers escorting them, than as a fortified place for maintaining the Sultan's authority over the village and adjacent country. It is, as well as the others on this road, subject to the Pasha of Damascus, who commits the charge of them to an officer styled *Amir al-Kal'a* (*Amir al-Kal'ah*), always of Arab origin, and chosen from among the family or tribe of *al-Kosheiriie* (*Kosheiriyeh*). The *Kosheiriie* are descended from the extinct tribe of *Beni Kosheir*, "of the family of 'Amir, the son of Sa'sa'a (*Sa'sa'ah*), the son of Hewazin of the 'Adnaniye (*'Adnaniyeh*)," according to *al-Kalkashendy*. They state that they were appointed to this office by Sultan Selim* (*Sultan Selim*), when he first opened this route for pilgrims to Mekka (*Mekkah*), and have ever since claimed the privilege of commanding the castles. The *Amir* (*Amir*) has nine or ten followers armed, as is usual with almost every individual in Arabia, with sword and firelock. They are scarcely intended for a garrison, and such is the contempt that the Bedouins evince for them, that they continually rob them in their excursions into the adjacent desert for fuel, and strip them of their clothes under the very walls of their stronghold. The *Amir* of each of the castles is summoned with his men to Damascus once every year to render an account of his command and expenditure, and then replaced in the castle he has quitted by another member of the same family. After remaining for a year at Damascus, he is again despatched, some months before the departure of the pilgrim *karawan*, with the annual supply of provisions granted for the castles, but is appointed to a new station, so that the small body of the *Kosheiriie* are kept in continual rotation of service and place.

The present town of Tebook (*Tebuk*) is said by the inhabitants not to be on the same site as the ancient town, so often mentioned in the history of Arabia by that name. An old building of hewn stone, now in ruins, called *Koseir* (little castle), and, also, *Tebook al-'Atika* (*Tebuku-l-'Atikah*), or Old Tebook, at the foot of a low range of sandstone hills projecting from the *Harra* (*Harrah*) mountains, and about 4 hours distant, W.S.W. from the present village, is believed to mark that site. This change in position for the modern town is, probably, to be attributed to the adoption of the present *karawan* route, and the abandonment of that, to the westward, by the ruin *al-Koseir*, which the pilgrims in early times followed in their pious journeys to Mekka (*Mekkah*). I have, likewise, noticed in many parts of Arabia, that, while the ancient inhabitants seem to have chosen the sides of hills for their residence, the modern people prefer the open plain. Thus, along

* Probably Selim I., who died, after a reign of 9 years and 8 months, in 926 A.H. (1520 A.D.).—A.

the eastern slopes of the Sherâa (Sherá) mountains, towards the desert, throughout the distance between Ma'an (Ma'án) and Tafilé (Tafíleh), scattered ruins and vestiges of ancient cultivation on plots of ground which are even now occasionally tilled and sown by Bedoon felláhs (husbandmen), may be seen. Among the few remains of ancient buildings now to be found in the neighbourhood of Tebook (Tebúk), the most remarkable, the inhabitants told me, are at a village called al-Karayá* (Karayah), some hours west of Dhât al-Hâgg (Dhatu-l-Hájj), the first pilgrim station to the north of Tebook (Tebúk). I was also assured by persons who asserted that they had visited the place, that scattered ruins of a large walled town, with buildings and caverns similar to those in Wâdí Moosâ (Wádf Músa), are still extant on the side of a hill, from the brow of which the water of a plentiful spring is supposed to have been led through plantations and fields in the plain below. This spring has ceased to flow, and the only traces of its having existed are in nearly obliterated channels through which it once spread life and fertility over a now desolate waste. A black dog, which is sometimes imagined by visitors to appear to them, is said, by the Arabs, to haunt the place and to be the guardian of its concealed treasures. Though prevented during my stay at Tebook (Tebúk) from visiting al-Karayá (Karayah), I see no reason to doubt the correctness of the account of it I received, which agrees in character with what I saw of some other ancient ruins in Arabia, such as at Udhrub, near Ma'an (Ma'án), and at Gubbe† (Jubbeh), where the alleged ancient site of al-Ferîry, in the mountain of Keteify, is likewise said to have had a copious spring, now dried up.

Among the high peaks which rise above the hills skirting the plain of Hamâdet Tebook (Hamâdet Tebúk) is Gabal Mukhtab,‡ so called from Khatâb (he preached), because from its summit the prophet is said to have preached a sermon to the Jewish and Christian inhabitants of the land, in order to convert them to his new creed. It is situated 5 h. N.N.E. of the present town of Tebook (Tebúk), and is supposed to be the furthest point northwards to which Mohammed advanced in person when carrying on his religious wars, in virtue of his alleged divine mission, against the unbelievers.§ From that place the prophet sent 'Alý (Alí)

* The town or village.—R.

† Kúbbeh?—R.

‡ The place of preaching:—the noun of place from the leading person of the present tense.—A.

§ The expedition against Tebook (written Tabuc by Sale and others), which then belonged to the Greeks, was undertaken by Muhammed with an army of 20,000 foot and 10,000 horse, in the summer of the 9th year of the hijrâ, which corresponds with the 30th year of the reign of the Greek Emperor Heraclius, and the 630th of the Christian era. Sale's Koran, notes, pp. 125, 154, 165, edit. 4to., 1734: Boulainvilliers, *Life of Mahommed*, London, 1731, p. 393; and Gibbon, *Ch. L.*, note, 147.—A.

and 'Umar to make war against Keidar* in al-Gawf (Jauf), and himself returned to Medīnā (Medīnah).†

Tebook (Tebúk) is under the special protection of the Bent 'Atiyá (Beni 'Atiyah). The principal sheikhs and 'akids ('akid), with other leading persons of that tribe, levy from the inhabitants the khâwá (kháwah) tribute, which is usually moderate and paid in articles of clothing, or, if provisions are short in the tents, in supplies of that kind. In return for this the Bedouin chiefs are bound to protect the inhabitants against exactions from other tribes, to which they are variously exposed, and the more so from being able to oppose but a very small force to their enemies. Thus, while the people of Ma'ân (Ma'án) can raise about 200 matchlockmen, the inhabitants of Tebook (Tebúk) can scarcely muster 40, and those ill equipped. Tebook being situated on a much frequented road, in a large open plain, across which flying parties of Bedouins, on plundering or warlike expeditions against hostile tribes, are continually passing, and where single adventurers, urged by poverty, are very frequently on the watch for purposes of marauding, its people are in consequence much exposed to depredation and robbery. When such cases occur, the kindred protectors are bound to interfere, and, if possible, procure the restoration to the protected of the goods or animals which have been taken or stolen‡ from them. Hence the surrounding plain is considered to be one of the most insecure parts of the desert, and scarcely any one ever quits or approaches Tebook (Tebúk) except by stealth under cover of the night. This grievously obstructs the intercourse with the place, and when the Bedouins of the protecting tribe move higher up into the Harrá (Harrah) mountains, or into the land of al-Hisma (Hisma), as was the case this spring, weeks sometimes pass away without their venturing to bring down their milk and sheep to the market of Tebook (Tebúk). So apprehensive, indeed, are the inhabitants, that, during the whole of the 20 days I stayed there, I could never persuade one of them to accompany me as a guide to al-Karayá (Karayah), or even to the old ruin of al-Koseir. The little intercourse which does take place between Tebook (Tebúk) and the nearest villages is principally carried on by a poor and despised branch of the Heteim clan of al-Sherârât,

* The present name, but anciently Ukeidar. — W.

† This statement of the present inhabitants does not quite agree with the Arabian histories. — W.

‡ There is a clear distinction, according to Bedouin notions, between taking and stealing. To steal is to abstract clandestinely. Whereas to take, in the sense of depriving another of his property, generally implies to take from him openly, by right of superior force. The last is plundering, the first is robbing; for the rules and consequences of which see Burckhardt, *Notes on the Bedouins*, vol. i. pp. 137, 157. — A.

called al-Suweifilê (Sewëifileh), whom the amir of the castle and the inhabitants of the village occasionally employ for this and other purposes.

Muhammed al-Sepâhî* (Sepâhî), in his geographical compendium, entitled *Awdah al-Mesâlik* (*Audhah al-Mesâlik*), gives the following notice of Tebook (Tebûk):—"Tebook (Tebûk) is a town between al-Higâz (Hijâz) and Syria; it contains a spring and date plantations. In it are said to have lived the men of Eiké† (Eikeh), unto whom God sent Sho'aeib; but Sho'aeib‡ was not of them, but a native of Madiân.§ The author of 'Al-Kânoon' (Kânûn) says that Tebook (Tebûk) is in the desert opposite Madiân; I (al-Sepâhî) say that Tebook (Tebûk) is to the E., and Madiân to the W."¶ From this last observation, taken with the passage immediately preceding it from al-Kânoon (Kânûn), I can draw no other conclusion than that both these geographers place Tebook (Tebûk) towards the E., in the interior of the desert, and Madiân westwards, on or near the coast, and in about the same latitude with Tebook (Tebûk). It is also stated by the author of 'Awdah' (Aúdhah), in another part of the work, that "Madiân is a ruined town on the Higâz (Hijâz) shore of the Red Sea, where the bay of 'Aḳabá' (Aḳabah) has only the breadth of a channel (Migrâ), opposite Tebook (Tebûk), at about 6 days' distance. It contains, in addition to a spring of running water, that same well from which in former times our Lord Moosa (Moses) gave to the herds of Sho'aeib (Jethro) to drink." These descriptions of Madiân would seem to indicate its site to

* No. 7505 of Rich's collection in the Brit. Mus.—W.

† See Muracci, *Al-Korân Soorat Al-Sha'arâ* (xxvi.), ayâ 175, and note, where Al-Eiké is stated to be a wood in the land of Madiân, where Sho'aeib, or Jethro, prophesied to the Madianites, or, according to our version of the Scriptures, Midianites.—A.

‡ Sho'aeib is supposed to be the same with Jethro (Arabicè Gâthar, sometimes Ghâthar) and Reuel of our version of the Scriptures. See Exodus ii. 18, and iii. 1; also Muracci, *Korân*, note to Ayâ 85, *Sooratu-l-A'râf* (vii.); S. Hood (xi.) ayâ 83 et seq.; S. 'Ankuboot (xxix.), ayâ 36; and Sale, ch. vii. note e, p. 126.—A.

§ See Muracci, *Al-Korân S. Al-A'râf* (vii.) ayâ 85; and Sale, note d, ch. vii. p. 126.—A.

|| و تبوك بين الحجاز وبين الشام و بها عين و نخيل و يقال ان بها كان اصحاب الايكة الذين بعث الله شعيبا اليهم و لم يكن شعيب منهم و انما كان من اهل مدين قال ض القافون و تبرك ض البر على محالته مدين اقول و تبوك ض اشرق و مدين ض الغرب

Wa Tebook bein Al-Higâz wa bein As-Shâm: wa bihâ, 'aein wa nakhil. Wa yakâl, an bihâ kân ashâb Al-Eike, elashân, bâth Allah Sho'aeiban ileihim; wa lum yakoon Sho'aeib minhoom, wa inumâ kân min ahli Madiân. Kâl fi-l-Kânoon wa Tebook fi-l-burr 'alâ mahâdhât Madiân; aḳool, wa Tebook fi-l-sharq, wa Madiân fi-l-gharab.—W.

be that of the present Maḩnā,* and I am not aware of any other place on the coast to which they would be applicable. If it be suggested, notwithstanding what is stated in 'Awdāh,' that the author of 'Al-Ḩānoon' might have intended to place Madian on the Sinā peninsula, which would be compatible with "Tebook being in the desert opposite to it," I reply, that the distance of Tebook from the coast seems to render such an interpretation improbable. Ahmed al-Dimashḩy relates, in his work of 'Aḩbār al-Duwal,' † that Sulṭān Suleimān Ḩān ‡ built the castle in Tebook, and placed in it a garrison of twenty janisaries to guard the spring against the Bedooins. Ibn Ayās, in the 'Nashḩ al-Azhār,' § states "Tebook to be a pleasant village, with date-gardens and corn-fields, and with a strong castle. . . . The prophet," continues the author, "undertook a warlike expedition against the inhabitants of Tebook, || and vanquished them; and this was one of the celebrated expeditions in which the prophet himself was present, and in which he personally assisted in the slaughter. Various events took place in that war. To Tebook are assigned the tribes, of Lakhm, Guheiné (Juheineh), Gudhām (Judham), and other Bedooins." The same tribes are by Ibn al-Aṭhīr, in the 'Tuḩfāt al-'Agāib,' ¶ stated to dwell in the land between "Tebook (Tebūk) and Wādī al-Ḩurā (Wādī al-Ḩura) and Eilé (Eileh)." There is not, so far as I know, at the present day any Bedoin tribe bearing the name of Lakhm; but I think that the present wide spread and much despised tribe of al-Sherārāt are to be regarded as descendants of Lakhm. Amongst the numerous clans of the Sherārāt in Wādī Sirḩān (Wādī Sirḩān), and in the neighbourhood of al Gawf (al Jauf), I met with one called al-Da'ḩiḩoon, after the name of the family of its sheikh, Ibn Da'ḩé; and that clan is, in 'Al-Ḩalkāshendy,' stated to be a branch of the Benī Ṣaḩhar, of the tribe of Tay, living in the land between Teimā (Teimah), Kheibar, and Syria. Other Bedooins

* Much uncertainty has prevailed regarding the site of the ancient Madian. D'Anville (Compend., &c., London, 1810) says: "The position of Madian (called by Ptolemy Moḩianna, l. iv. c. 5) not far from the sea, is called by the Arabs Megar-el-Shu'ib, or the grotto of Shu'ib." I think that this should be Mugheir-al-Shu'eb, as in Mr. Walker's last map upon the authority of Dr. Wallin: it will then rather mean the garden of Shu'eb. Mr. Forster, in his late interesting work on the geography of Arabia (vol. ii. p. 116) merely says, without fixing the site of Madian, "that the Moḩianna of Ptolemy identifies itself with the Madian of Abū-l-Fedā and the Midian of Scripture, at the mid-coast, on the Arabian side of the gulf of 'Akābā." Niebuhr, without examining the question, assumes Muweilah to be the ancient Madian. (Descrip. de l'Ar. p. 325.) Maḩnā, so spelt by Dr. Wallin, is written Maḩnā on Captain Moresby's chart.—A.

† Angliḩè, Tidings of changes of fortune.—A.

‡ Suleiman I. ascended the throne in 1520, and died in 1566 A. D.—A.

§ Angliḩè, Smelling of flowers.—A.

|| Tebook was then subject to the Greek Emperor Heraclius. (See note † p. 316.)

¶ Angliḩè, Precious gift of wonders.—A.

of the name of Benî Şakhar, descended from the Kaḥṭāniyé, are by the same author stated to reside about al-Karak, where they are still to be found in great numbers, living in amicable and brotherly relation with the Hegâiâ (Hejáyá) and Sherârât (Sherárât). The Guheiné (Juheineh) are yet a large tribe in the mountains of al-Higâz (Hijáz); the Benî 'Ukbá ('Ukbah) and Benî Bely (Belf) are scattered members of the posterity of Gudhâm, the brother of Lakhm. All these tribes are descended from the same original stock of the Kaḥṭāniyé (Kaḥṭāniyeh) Arabs, who, after their emigration from al-Yaman (Yemen), seem to have gradually displaced the 'Adnāniyé (Ismā'īliyye 'Adnāniyeh Ismā'īliyyeh), who were the first occupants of this land. Now the Kaḥṭāniyé are, in their turn, being driven out into the mountains and into the outskirts of the desert by 'Enezé ('Anezeh) tribes descended from the 'Adnāniyé ('Adnāniyeh), or if, like most of the Heteim clans, they prefer paying tribute to more powerful tribes, they are allowed to live as they can in the interior among Bedooins, by whom they are little respected.

1848.
April 5.

On the 5th of April, I left Tebook (Tebūk) accompanied by two Bedooins of the Bely tribe. Favoured by a thick mist, which concealed us from observation and saved us from unpleasant encounters with strangers, we struck across the plain, in a direction S. by E., leaving the pilgrim road, which runs S. E., on our left, close to Tebook. The soil near the town is quite barren; but streaks and patches of a plant called rawd* (raudh) soon begin to enliven the plain, and increase in extent up to the first hills of the Harrá (Ḥarrah) range, when open level valleys with bushes succeed. After marching for 5½ h. over the plain, we entered among these hills and halted for the night.

On the 6th, our way lay over broad open valleys, between the Harrá (Harrah) mountains on the right and ranges of lower hills on the left. As we advanced, the valleys gradually diminished in width, and in about 2 h. we were in a regular ravine, running S. E., parallel with the pilgrim road, at a distance of about 3 h., being separated from it by intermediate hills. After travelling for 7½ h. from the place where we had passed the night, we came to a defile called Naḵb Darb al Bekrá† (Darbu-l-Bekrah). In the valley below there are many large detached stones, on some of which I observed, in passing, inscriptions in the same character as those found in Wādī 'Uweinid and Wādī Gubbé (Wādī Jubbeh); but I was unable to copy any of them, as my companions were afraid of being surprised by enemies, and robbed of the packages of clothes with which they had loaded their camels at Tebook (Tebūk), and could not be prevailed upon to stop.

* Plur., Riyāḍ (riyāḍh).—W.

† The Bekrá road defile.—A.

We proceeded for 3 h. more in the same defile, and then lay down for the night.

On the 7th, we passed through a still narrower part of the valley or defile, called Wâdi Akhdar* (Akhdhar), by the Bedouins usually pronounced Wâdi Khadar (Khadhar), 3 h. to the W. of the castle and station of the same name, at which the pilgrims pass their first night from Tebook (Tebúk). This valley is likewise strewn with large stones and fragments of rock, some of which bear inscriptions like those previously noticed, with clumsily-cut figures of different desert animals. In 3½ h. from the entrance of this valley we reached a natural cistern in the rock, called Ghadir al-Râshidé† (Ghadhiru-l-Râshideh), where we filled our emptied skins with a fresh supply of good rain-water. Up to this place we had passed through valleys more or less regular, bearing the general name of Darb al Bekrá (Darbu-l-Bekrah); but here the mountains began. After ascending for ½ h. we came to a small circular rocky plain, of a dark brown hue, called Menzil al Hâgg‡ (Menzilu-l-Hâjj), because in former days, as my companions told me, when the pilgrims in their holy journey used the Darb al Bekrá road this ground was a halting-place, and tradition says the whole karawân once perished on it from thirst; and the fatal spot has ever since been called "the Pilgrimage Station."

The journey was then performed with mules; but these animals, being ill suited to the desert, were soon replaced by camels, and the present route selected in preference to that by Darb al Bekra (Darbu-l-Bekrah), which was considered impracticable, from its want of water. The valley of Darb al Bekrá (Darbu-l-Bekrah) begins about 6 h. S. of Tebook (Tebúk), and runs with a slight bend towards the E., nearly parallel with the other road as far as al-Hijr (Hijr), where it opens into a larger valley, called Wâdi Negd (Wâdi Nejd), which, continuing in a south-easterly direction, descends towards the interior of Arabia.

From Menzil al Hâgg (Menzil-al-Hâjj) we turned to the right, gradually ascending the mountains of al-Harrá (Harrah), and crossing level tracts of a dark stony soil, broken here and there by conical or pyramidal masses of rock. At the base of these masses the ground is thickly strewn with black porous stones of peculiar lightness. The mountains themselves here consist of red sandstone, not unlike that near Heidelberg; but their sides and ridges are so covered with these black fragments that the red colour of the rock beneath can only be perceived on a close examination.§

* Green—el-Akhdar. Burekhardt, Syria and Holy Land, p. 659.—R.

† Pool of Rashidé.—A.

‡ Pilgrimage station.—A.

§ It is possible that the rock of these hills is ferruginous sandstone; the red

Our course across these mountains was W. S. W. for $8\frac{1}{2}$ h., when we began to descend towards the lower land of al-Gaww (Jaww), inclosed on all sides by branches of the Harrá range. Winding down the mountain side by a circuitous and rugged path for $\frac{1}{2}$ h., we reached one of those plains the Arabs call Manka'. They denote by this name sterile spots with a hard sandy bottom, upon which the waters of the streams caused by the winter rains collect together into a shallow lake, which lasts, according to its depth, until the water is absorbed by the thirsty sand or evaporated by the sun, when the ground becoming parched breaks up into detached clods, separated by deep chinks, and never produces any vegetation. Similar places are often met with in Arabia, and always known by the same name of Manka'. Having crossed this manka' in the direction of its length, S. by E., in $1\frac{1}{2}$ h., we entered a plain of soft sand, called al-Mahír (Mahír), which was as exuberant of pasture as the other was barren. It lay before us one sheet of verdure, being covered with a plant called al-hárrá (hárrah), of a bitter but very pleasant taste, something like our cresses. This is a pasture of which the camel is very fond. When dried it is also used as a stomachic by the Arabs of the towns, who then call it rishád (rishád). For $5\frac{1}{2}$ h. we continued to cross similar fields and sandy hillocks covered with a variegated and abundant vegetation, which formed a striking contrast to the black, dreary declivities of the mountains by which they are inclosed. We traced in the soft sand the footsteps of the herds lately pastured here, and, by following them, soon found the tents of the tribe to which my companion belonged.

The land of al-Harrá (Harrah), of which al-Gaww (Jaww) forms the southern and almost only inhabitable part, is an extensive plain of sand, of the same character as al-Hismá (Hisma) and the Negd Nufood (Nejd Nufúdh), and is bounded on the W. by the Tehamá or Shefáá (Tehamah or Shefá) chain throughout its extent, between Muweilah and Wegh (Wejh); on the N. by the land of al-Hismá (Hisma) and that portion of the Harrá (Harrah) mountains which extends from el-Záwüé (Záwiyeh) north-eastwards, along the edge of al-Hismá (Hisma) and by Wadi 'Uweinid, as far as the plain of Tebook (Tebúk), where the hills turn round at an acute angle to the S.; on the E. by the irregular ridges of these mountains, which run down, from the angle just mentioned, parallel to the Shefáá chain, along the valley of Darb al-Bekrí to Híjr (Hijr); and on the S. by a cross branch of

colour being due to the presence of oxide of iron, which becomes a black peroxide after having imbibed more oxygen from the atmosphere; and thus small fragments become externally quite black, and from the action upon their surface, have very much the appearance of cinders. The same thing may be observed in the valley of Koseir, about 12 miles W. of the town of Koseir on the road to Keuné, in Egypt.—A.

the same mountains, parallel with the portion of them forming the northern boundary, and running from al-Tehamá to al-Higr, where it meets the part of the range forming the eastern boundary at an obtuse angle; so that the land of al-Harrá (Harrah) may be considered as a rhomboid, with its angles facing the four cardinal points. The width of this land, from Darb al-Bekrá (Darbu-l-Bekrah) to the Shefâa chain, is reckoned at 2 days, and its length from al-Hismâ to Wâdî Negd (Wâdî Nejd) at 5 days' journey with a camel. Wâdî Negd (Wâdî Nejd) was described to me by the Bedouins here as a valley running along the southern side of the Harrá mountains, and descending in one direction to Wegh (Wejh), and in another towards Medínâ; but not having visited that part myself, I cannot accurately define its course. The Harrá mountains on the side of Wâdî Negd (Wâdî Nejd) I have reason to suppose to be very irregular, and intersected by sandy valleys running in a south-east direction from the Nufood, land of al-Gaww (Jaúu). Of these valleys the most considerable is the Wâdî 'Awrish ('Aúrish), where the Bely tribe have long possessed date plantations, and in rainy years cultivate oats and maize.*

The Bely tribe claim the exclusive possession of the whole of the land of Al-Harrá. The tribe generally dwell in Al-Gaww (Jaúu), where, without their especial permission, no other Bedouins have a right to encamp. Notwithstanding the advantageous situation of their district between the shore of the Red Sea, Al-Higâz (Hijâz), and Negd (Nejd), and its easy means of communication with Wegh (Wejh), Tebook (Tebúk), Teimâ (Teimâ), and Medínâ (Medinah), they seldom move out of it. But, as the land has no wells nor water, except what remains after rains in pools and cavities among the rocks, which form natural cisterns (gabw—jabw), the Belys are sometimes, in years of drought, compelled to go in search of water and pasture for their cattle into remote districts about the neighbourhood of Damascus and Aleppo, where, for instance, they passed the spring of the year 1846. It was to the same parts of Arabia, and to the country about Hams,† that, according to al-Sam'any (Sem'ani), in his Ansâb (Ansâb), the former occupiers of al-Harrá, the powerful tribe of Suleim, used to migrate.

The Bely, although not a very numerous, were a rich tribe, possessing plenty of horses and cattle till 1847, when they were surprised by a large party of Huweitat, of the clan of Ibn al-Gâz, from Wâdî Moosâ (Wâdî Músa), which stole upon the pasture grounds and managed to carry off all their horses and the greater number of their camels before the owners were aware of the enemy's presence. They had, however, already indemnified

* Probably dhurrah sorghum vulgare; or saccharatum.—R.

† The ancient Émesa (Hemesa).—Plin.—A.

themselves pretty well, for though still without horses, they had secured a considerable number of camels from the Sherârât and other neighbouring tribes, towards whom their relations were such as to justify mutual war and plunder.

Fearing the growing power of the Shammar Arabs, and the increasing authority of their Sheikh, Ibn al-Rashîd, who is of the Wahbâby creed, and, in the name of Ibn Sa'ood (Sa'ûd), the so styled Imâm and chief governor of all Negd (Nêjd), attacks and subdues those tribes who have not yet yielded to his sway, under the pretence of a holy war against infidels, as the Wahbâby puritans call all other Muhammadans, the Bely tribe lately joined his confederacy by voluntarily paying him the tribute commanded in the Korân under the name of Zikâ.* This membership of the confederacy, however, neither entitles them to any protection from Ibn al-Rashîd against hostile tribes, nor imposes upon them any constraint in their transactions with other Bedooins, whether of the confederacy or not; and the Bely still claim the same right as formerly to levy the Khâwé (Khâweh) tribute from Teima, although that village belongs to, and is inhabited by, Shammar Arabs. They also levy the same tribute on the town of 'Elâ† ('Elâ), which, though belonging to their tribe, is under the protection of the Turkish pâshâ of Medîná (Medîna), and by him assessed for the Zikâ. The Bely likewise claim Wagh (Wejh) on their own account; but its inhabitants are secured by the Egyptian government from all extortions except its own. The last-named place generally supplies the Bely tribe with grain, brought at a low price from Koseir, on the Egyptian shore of the Red Sea; Wâdî 'Awrish (Wâdî 'Aúrish), Téimâ, and Elâ ('Elâ), with dates; and the pilgrims with coffee brought from al-Higâz (Hijâz), and with clothes from Syria or Egypt.

The territory through which they should escort the Karawâns extends, on the Egyptian road, from Dhobâ (Dhobâ) to Wagh (Wejh), and, on the Syrian, from Birket al-Mu'adhdham‡ (Mu'adhdham) to Higr (Hijr). At Dhobâ (Dhobâ), the Benî 'Ukbâ ('Ukbah) are relieved in guarding the Egyptian karawân by the Bely clans of Mu'âkilé (Mu'âkileh), Arâdât (Arâdât), and

* The Zikâ, or legal alms, although made obligatory, are not defined by the Korân. They are fixed by the Hadîth, or traditions of the Prophet, collected in four works of orthodox authority, and respectively named *Ṣaḥîḥ Bokhârî*, *Ṣaḥîḥ Muslim*, *Ṣaḥîḥ Turmady*, and *Ṣaḥîḥ Râwandî*. The first is the most esteemed. Sale says that Zikâ, or the legal alms, according to the prescriptions of the Mohammedan law, are to be given of five things:—1st, of cattle, i. e. of camels, kine, and sheep; 2nd, of money; 3rd, of corn; 4th, of fruits, viz. dates and raisins; and, 5th, of wages sold. Of each of these a certain portion is to be given in alms, being usually 1 part in 40 (Sale, *Prelim. Disc.*, p. 110). See also, for full information on the subject of alms, D'Osson's *Vie* of the Othoman Customs, Laws, and Ceremonies, wherein, under the religious code, alms, eleemosynary and legal, are treated at length. There is an English translation of the religious code in 1 vol. 4to., Philadelphia, 1788.—A.

† Also 'Elâ.

‡ The great pool or lake.—A.

Beni Loot (Lút), who dwell in and near Wâdi Ferâ'; and the escort of the Syrian pilgrims on their way is continued by the Muwâhibs (Muwâhîbs), the principal clan of the Beni Bely, to which the family of their chief, Sheikh Ibn Dâmâ (Dámâ), also belongs.

The Bely is the first tribe in this part whose dialect assimilates to that spoken in by the inhabitants of Negd (Nejd), and the 'Enezé Bedouins, which differs principally from that current in the towns, and among Arabs of a less unmixed race, by its frequent use of the tanwin, and by certain grammatical forms and idiomatic expressions from the ancient language; and still more strikingly by the peculiar pronunciation of the letters ḳ (kâf) and k (kâf), called *hashkashé*,* by the Arabian grammarians.

The Beni Bely profess themselves to have adopted the reformed creed of the Wahhâbiyé (Wahhâbiyeh), and as a proof of their sincerity, pay the Zikâ tribute, and regularly observe the daily prayers and the rites and ceremonies prescribed to that sect; but, saving these matters, they are as ignorant of the fundamental doctrines of Islâm and evince as much indifference to the scholastic subtlety of its jurisprudence as the other Bedouins.

Although said to be a branch of the Kahtâniyé (Kahtâniyeh) of Yemen, I thought I could trace in their features a closer resemblance to those of the 'Enezé and other Syrian tribes descended from the 'Adnâniyé ('Adnâniyeh), than in the case of the Huweitât (Huweitât) and the Bedouins of western Arabia and Egypt. Many of the Beni Bely were of a fair complexion, which is very rarely seen in the desert, never, I think, amongst any but the northern tribes.† It was not only their features and language which reminded me of the 'Enezé, but their character seemed to be marked by much of that profuse hospitality which distinguishes the Bedouins of the interior from their neighbours on the outskirts of the desert; they have likewise a great deal of the vivacity and lightness of mind so common among the northern Arabs, but so foreign to the austere and rigid manners of the Wahhâbiyé.

* i. e. pronouncing these letters when final, in certain cases, as if written *kash* and *kash*.

† Though this may be generally true, men of a fair complexion are certainly found in the hills of Yaman, and near 'Adan. A principal sheikh from the neighbourhood of Lahg—so named after Lahg, the son of Ghawth (Wâil in al-Kâmos), the son of Kutn, the son of 'Arib, the son of Zubeir, the son of Ayman, the son of al-Hameisa, the son of Hamîar, of the Kahtâniyé (Mâgamu-l-Baldan, in voce Lahg)—18 miles N.N.W. of 'Adan, whom I saw in 1841, was decidedly fair, with a beard inclining to a reddish tinge. I also recollect having seen an Albino boy at 'Adan, but such a case was a phenomenon. The view taken by Dr. Wallin seems to go no further than that fair skins among the present Arabs are more peculiar to the northern and their kindred tribes of the 'Adnâniyé. It may be mentioned, in corroboration of this, that the Jews in Yaman, and particularly at 'Aden, as compared with the majority of the inhabitants, are a fair race—those who may be considered in better circumstances especially so. It has been surmised that these Jews migrated to Yaman upon the final destruction of the temple of Jerusalem by Hadrian.—A.

In the book of Al-Kalkaskendy, so often quoted by me, it is stated that "the Benoo Bely are of the race of Kudâ'a of the Kahtâniyé. The patrial noun from their name is Belawy. They are of the posterity of Bely, son of Amroo (Amrú), son of Al-Hârith (Hârith), son of Kudâ'a (Kudhâ'ah).^{*} The author of Mesâlik Al-Absâr says:—"Their abodes are now in Dâmâ, which is the land between 'Uioon Al-Kasab and Akra (Akra), at the mouth of the defile (fumm Al-Madik); and the escort of the pilgrims through this land devolves upon them. Part of them dwell in Upper Egypt." Al-Hamdâny (Hamdâni) says, "their dwelling places are in Akhmûm, (Akhmûm), and in the land south of that town." The 'Uioon Al-Kasab and Al-Akrá (Akra) are by Ibn Ayâs, in his book entitled Nashk Al-Azhar, described to be "pilgrim stations on the shore of the Red Sea." He continues—"In the 'Uioon Al-Kasab there are springs of running water, around which grows the Persian reed. It is a resting place for the pilgrims, who pitch their tents on the bank and bathe themselves and wash their clothes in the springs. This is the spot of which the poet speaks when saying—

"My friends, do not forget your vows to the homeless youth,
Whose companion is sorrow, and whose eyes are wet with tears:
He remembered his vows to you on the way to Al-Higâz,
And neither in Al-'Uioon nor in Akra did he taste of slumber."

In a list of the pilgrim-stations on the Egyptian road given by an author named Hâfidh Ahmad, in a 'Historical Compendium of Egypt,'† the 'Uioon Al-Kasab is mentioned as the first station north of Muweilah. That station at the present day is only known under the abbreviated form of its name, Al-'Uioon, as the Arabian poet quoted also calls it, but there can be no doubt about its identity with the 'Uioon Al-Kasab of the geographers. Akra (Akra) (in the list of Ahmed erroneously written Akra, Akrah), which is the first station south of al-Wegh (Wejh) is placed on the map of Arabia by Berghaus in the mouth of a mountain defile (fumm Al-Madik). 'Uioon Al-Kasab and Akra are the limits assigned to Wâdî Dâmâ, and to the possessions of the Bely tribe in former times. The present boundaries of the district, through which, as belonging to them, the Benî Bely are bound to escort the Egyptian pilgrims, are, as before mentioned, Dhobâ (Dhoba) and Wegh (Wejh), and of this that part only lying between Dhobâ and Iṣṭabl 'Antar, which is now called Wâdî Dâmâ.

The first inhabitants of Al-Harrâ were, as I have noticed,

^{*} The Benî Bely are of the Hamyaric stock of Kodâ'a, the son of Hamyar, the son of Sabâ, the son of Yashhab, the son of Ya'rah, the son of Kahtan (Joktan), the son of 'Aâbar (Eber), the son of Sâlih, or Shâlih (Saluk), the son of Arfaḥshadh (Arphaxad), the son of Sâm (Shem), the son of Nooh (Noah). Poc. Spec. 42; and Abou-l-Fedâ, ad calcem, Poc. 471, 423.—A.

† No. 9972 of the Brit. Mus. MSS.—W.

according to still current traditions, the once powerful tribe of Benî Suleim, who, besides this land, are said to have occupied the towns of Teimâ and Kheibar. Of this now vanished tribe Al-Kalkashendy gives the following account: the Benî Suleim are a powerful tribe of Keis; the patrilial noun from their name is Sulamy; they are of the posterity of Suleim, son of Mansoor (Mansûr), son of 'Akramâ ('Akramah), son of Khaṣafâ (Khaṣafah), son of Keis. Suleim had a son Buhtâ (Buhtâh), through whom his whole race is descended. The author of *Al-Ibar* says, "their abodes were in the land called 'Aliyé Negd (Aliyat Negd), that is, the higher parts of Negd, near Kheibar, and that, besides other lands, they possessed Harrât Benî Suleim, and Harrât Al-Nar, lying between Wâdî Al-Kurâ and Teimâ. The same author adds—"In the present day there are no traces of them in their original land, but numbers of them are to be found in Afrikiyâ," &c. The author of the *Kitâb Al-Buldân* states, the lands known by the name of Al-Harrâ (Harrah) in Arabia to be eight, to two of which he gives the above-mentioned names of Harrat Benî Suleim and Harrât Al-Nâr, without further determining their situation. Although the present Harrâ of the Benî Bely, which I have endeavoured to describe, is not situated precisely between Teimâ and Wâdî Al-Kurâ (Wâdî-l-Kúrah), as stated by the author of *Al-Ibar*, I can only regard it as identical with the Harrâ of the Benî Suleim.

With regard to Wâdî Al-Kurâ (Wâdî-l-Kúrah) the author of the *Nashḥ Al-Azhâr* describes it to be a valley in the land between Medinâ and Syria, and possessing a castle built amidst mountains, in which are excavated grotto habitations. The soil of this valley, he continues, is called Al-Athâlib, which signifies tracts covered with stones and rubbish; and here dwelt the people of Themood, whose well, from which they drank by turns with the camels of Sâlih, is still to be seen. The description by Ibn Al-'Athîr, in his book of *Tuhfât Al-'Agâib*, amounts to the same thing. The author of the *Awḍah Al-Mesâlik* contradicts Ibn Hawḳal, who places the town of Higr in the mountains of Al-Higâz at a distance of one day's journey from Wâdî Al-Kurâ, and himself determines the distance between the two places to amount to more than five days. Al-Sam'any, in the *Kitâb Al-Ansâb*, gives the distance between Higr and Wâdî Al-Kurâ 18 miles. Other geographers in specifying the limits of the Arabian Peninsula state the Red Sea to extend along the coast from Eilé, by Mudian, Wâdî Al-Kurâ, and Yambu', &c., down to Al-Yaman. Upon weighing the discrepancies between these statements, by the Arabian authors, of the situation of Wâdî Al-Kurâ, I conceive that the mouth of that valley ought to be sought for on the coast between Mudian and Yambu', probably at Wegh, and its head at Higr, where old excavations of the same

character as those in Wādī Moosà, and a mountain bearing the name of Gabal Al-Nākā, still attest the abodes of the men of Themood and the miraculous she-camel of Salih.* On the map of Arabia by Berghaus, a valley close by Medina is marked with the name of Wādī Al-Kurà. The author of *Awdah*, when stating the above-mentioned distance of 5 days' journey between Higr and Wādī Al-Kurà, does not explain whether the situation of that valley is by Al-Wegh, to the W. of Higr, or by Medina, to the S. of it. In either case, he would be nearly right in the distance, which, from Higr to Wegh in the one direction, or to Medina in the other, is now reckoned at about 4 days' journey. The difference of 1 day may, I think, be attributed to the author's over estimating the length of the two roads—a sort of error into which I find him liable to fall in most of his computations. Although the name of Wādī Al-Kurà seems to be unknown to the present Bedooins, I cannot, after the inquiries I made, hesitate to identify it with the present Wādī Negd (Wādī Nejd), which extends, as before stated, along the southern side of the Harrà mountains, from the neighbourhood of al-Gaww (Jaúu) towards Wegh (Wejh) on one side, and towards the interior of the desert, by a south-easterly course, on the other.

While I was living among the Beni Bely they had been almost daily moving from place to place till they had again approached the plain of al-Manķa', whence I first entered the nufood land of al-Gaww (Jaúu).

1848.
Apr. 16. On the 16th of April, I left my hospitable friends, accompanied by a party of 8 men, who, under the conduct of my guide, the 'Akíd of the tribe, after having taken me to Teimà, intended to proceed on a plundering expedition (ma'íra, pl. ma'áir) (ma'írah, pl. ma'áir) against the Sherárât (Sherárát) Bedooins, in the neighbourhood of al-Gawf (Jaúf). Our way lay over the dark, broken ground of al-Harrà, past several black looking peaks,† with al-Manķa' to our left: after travelling 5 hours in an E. S. E. direction, we reached a natural cistern in a hill, where we found good rain-water; and this being the appointed rendezvous for other adventurers who were expected to make up their mind to join the expedition, when we left the tribe, we made a halt for the night.

Apr. 17. On the 17th, we were awakened early by the arrival of new volunteers, or, as they were called, partners, in the expedition.

* For an account of the mission of the prophet Salih to the people of Themood, and the miracle of causing, at their request, the she-camel (Nākā) to issue from the rock, for converting them to the faith of the only true God, see Isma'íl Ibn 'Alý (apud Muracci), *Koran*, ch. vii. ayá 73, note. Salih is supposed to have lived between the time of Hud and of Abraham, and by Bochart to have been the same with Peleg, *Gen.* xi. 16. Salih of *Gen.* xi. 12, was the grandfather of Peleg. D'Herbelot, however, considers Salih to be the same with the last-mentioned patriarch, Salih. See *Sole*, *Pref. Disc.*, pp. 6, 7; and *Koran*, pp. 123, 124.—A.

† Dr. Wallin says, "of volcanic appearance;" but see note at p. 321, and also text, p. 329.—A.

We rose immediately and continued our journey, which for 4½ h. was over the same kind of dark, mountainous ground, and in the same direction of E. S. E. as yesterday, when we reached the valley of Darb al-Bekrá (Darbu-l-Bekrah), which has here a rocky, uneven surface, and a much greater expanse than where I had crossed it higher up to the N.; so much so, as to lose the appearance of a valley. We then passed over irregular ranges of lofty hills, and in 2 h. 20 m. came to the high road of the Syrian pilgrims, at a spot about 3 hours' journey N. of Dār al-Hamrá (Dāru-l-Hamráh), which is the third station south of Tebook (Tebúk). The pilgrim road here takes for a considerable distance a south-eastern course, through a broad and extensive valley, bordered on its north-eastern side by higher and more regular ranges of hills than those we had just crossed, but which are probably an eastern branch of the same system, although the volcanic* aspect and the layer of black fragments by which the natural red colour of the sandstone is hid in other parts of the Harrá mountains, is now no longer observable. We crossed this valley in a S. S. E. direction in 1 h. 20 m., and then began to ascend the hills on the opposite side, through a defile called Aboo Guneib (Abú Guneib). The view from the top of the defile, as far as the eye could reach, discovered a succession of undulating sandstone hills, becoming gradually lower towards the E., and crossed by winding valleys, opening into a larger one called Wādī Martā (Wādī Martā), which runs parallel with the pilgrim road, and gradually widens with a south-east descent.

On the 18th, our way continued through the same defile for 40 m., when, turning to our left, we entered a lateral valley, in which we proceeded in a N. E. direction for 1 h., and afterwards with a course due E. for 1 h. 10 m. The mountains had now decreased to undulating stony table-land; and instead of sandy valleys with artā bushes, through which we had lately passed, we had shallow rocky ravines. After a march of 7½ h., in an easterly direction, over much rough ground, we arrived at a cistern formed in the side of a hill, on the edge of a large plain which commences here, under the name of al-Hálá (Hálah), and extends, with few interruptions, as far as al-Kasím (Kasím). We filled our waterskins in great haste from the cistern, which was well supplied, and immediately continued our journey; for my companions, though on a plundering expedition, were afraid of encountering any hostile party of Bedouins stronger than their own on a similar mission, and did not consider us safe before we had the cistern 1½ h. behind us. During this day's march we made continual circuits to avoid our footsteps on the soft sand being tracked by

1848.
Apr. 18.

* See note, p. 321.—A.

others who might happen to pass the same way; but on reaching the hard ground of some dried-up pools, or *manka's*, which crossed the plain, we resumed an easterly course, until we made a halt for the night.

1848.
Apr. 19. On the 19th we continued our journey by a rather tortuous course across *manka's* and along the bottoms of low flat valleys, and in 6 hours and 10 minutes arrived at Teimâ (Teimâ), our march having been somewhat lengthened by the detours we had made.

Teima is allowed by all the Arabs of the present day to belong to Negd (Nejd), and may be regarded as one of the frontier towns on the western side of that region. The reason why the country west of Teimâ is not considered to be a constituent part of Negd (Nejd), is, I believe, that this western tract, taken in its whole extent, forms the bottom of a gently sloping valley, from which a person on having passed to the higher *nufûd* land of Negd (Nejd) has ascended (*ingâd*).*

The region of Negd (Nejd) commences on the vast plain of northern Arabia lying between the Syrian mountains and the river Euphrates, and extends, with the Sherâa and Shefâa chain for its western boundary, and the sand hillocks of Wâdî Sirhân (Wâdî Sirhân) which begin about two days S. of Damascus and continue as ranges of the *nufûd* (*nufûdh*) land of Negd as far as the granite mountain of Agâ, for its eastern boundary, down to the neighbourhood of Teimâ, where it opens with the land of al-Hâlâ (Hâlah) into another considerable plain corresponding in its general features with the northern part, and stretching from Medînah (Medînah) and Tâif (Tâif) along the chain of Gabal al 'Arid (Jabal al 'Aridh), which is the southern limit of Negd, to the Persian Gulph. The first of these tracts, though regarded as a plain, I think, would be more properly considered as an extensive valley gradually diminishing in width between the boundaries mentioned above, and descending towards al-Hâlâ (Hâlah), whence the slope is imperceptibly continued to the Persian Gulph. Taken in the aggregate, Negd presents an undulating and rocky surface, intersected, on the west, by offshoots of the hilly ranges which run out from the western chains, and, in other places, varied by the occurrence of broken groups, and of isolated hills and peaks, apparently unconnected with each other. The plains among these hills are of greater or less expanse; and consist sometimes of soft *nufûd* sand, producing a scanty desert vegetation, and, sometimes, of a hard and barren soil, totally destitute of verdure and life. In the

* *Ingâd*, which signifies *he ascended*, and more particularly up to high land, such as Negd, is on the 4th or causative form of the verb from the root *negd*, meaning as a verb *overcame*, and, as a noun, the region here referred to, and also high land in general, as contradistinguished from lower land.—See *Negd* in n. at p. 51.—A.

western parts sandstone exclusively predominates; blocks of limestone are occasionally seen in the *nufūd* (*nufūd*) and adjacent lands; but granite, as far as I could ascertain, is never met with, except in the *Tay* (*Tāi*) mountains. On account of its rocky soil, *Nejd* has scarcely any water, and may be characterised as one of the most sterile and desolate parts of Arabia. In the year 1845 I crossed this country from near *al-Tafilé* (*Tafilé*) to *Wādī Sirhān* (*Wādī Sirhān*), on a fast camel, in 52 hours (260 miles?), and on that line I estimated the distance from the Syrian pilgrim road above *Dār al-Hamrā* by *Teimā*, to the nearest *nufūd* tract in *Negd*, at about 24 hours journey only.

The population of *Teimā* may be estimated at one hundred families, all of the tribe of *Shammar*. They are of two clans, the one called '*Aly*' (*Alf*), the other *Hamdé* (*Hamdeh*). The *Beni Shammar* differ considerably in the characteristics of race from the '*Enezé*' (*'Anezeh*) tribes* of the surrounding desert. In the features of the '*Enezé*' (*'Anezeh*), a Syrian, and occasionally a perfectly Jewish cast is plainly perceptible; in those of the *Shammar* an expression predominates which reminds us of their being kindred to the Arabs of *Yaman*. This community of race, I fancied, I could always trace in the tribes descended from the *Kahtāniyē*, although, certainly, more or less distinctly, according to the time which may have elapsed since the respective tribes migrated from their original abodes; and under indications of greater or less purity of descent according to their subsequent intermixture with the inhabitants whom they found in the lands in which they settled. The *Beni Shammar* being, according to their own tradition, one of the tribes who emigrated latest from Southern Arabia, retain the *Yamani* features of their ancestors in a greater degree, perhaps, than any other tribe from that country; and so remarkable is the peculiar cast of their countenance, that it can hardly fail to strike any one who sees them, at least after having recently been among the '*Enezé* *Bedouins*.

The *Beni Shammar* are under the authority of *Ibn al-Rashīd*, the chief *Sheikh* of all the *Shammar* in *Negd*. In their government, like other *Wahhābiyē*, they follow the *Islām* jurisprudence,† more than the traditional law of the desert. In causes of importance, the parties are summoned to *Hāil* (*Hā'il*), to appear before *Ibn al-Raschīd* (*Ibnu-l-Rashīd*), who, after consulting his *Kādī*, gives his decision according to the doctrines of the orthodox sect of *Ahmad al-Hanbaly*, to which the *Wahhābiyē* have adhered from the beginning of their reformatory career. Some modern authors have alleged that the *Wahhābiyē* adopt the *Hanafy* creed; others,

* The '*Enezé*' are the descendants of *Asad*, the son of *Rakī*, the son of *Nazār*, the son of *Ma'd*, the son of *Adnān* of the posterity of *Isma'il*.—*Poc. Spec.*, pp. 46, 47.

† See Appendix, p. 342.

that they have established a creed of their own and constitute a distinct sect. Both assertions are equally unfounded.* The Wah-shâbiyé are merely reformers, and follow the rite of al-Hanbaly.

Teima stands on a mass of crystalline limestone, very slightly raised above the surrounding level. Patches of sand, which have encroached upon the rock, are the only spots which can be cultivated. The inhabitants, however, have considerable date plantations which yield a great variety of the fruit, of which one kind, called al-hulwâ (hulwah), *the sweet*, is esteemed the best flavoured in all Arabia. Grain is also cultivated, especially oats of a remarkably good quality, but the produce is never sufficient for the wants of the inhabitants. The greater portion of the gardens are watered from a copious well, called bir al-haddâg (bir-al-haddâj), in the middle of the village; but more distant plantations are irrigated from wells near them. The hydraulic contrivance, by which water is raised for distribution through channels among the plantations, is the same as is used throughout Mesopotamia as well as in Negd, viz. a bucket of camel-skin hung to the end of a long lever, moving upon an upright pole fixed in the ground.† The revolving sâkiie,‡ or water-wheel of Egypt, seen occasionally in the towns on the coast, is never found here. This, as well as the style of the houses, and the cultivation of the gardens, and many other peculiarities, reminded me that I had now entered Negd (Nejd). In the villages on the coast the influence of Egyptian customs is very manifest; in those along the Sherââ chain, and in the interior of the desert, as far as al-Gawf (Jaûf), Syrian usages predominate. Teimâ shows the first indications of a different sort of civilization brought, as it appears to me, from Mesopotamia into the adjacent part of Arabia, and gradually adopted throughout Negd (Nejd).

The distance from Teimâ to 'Elâh ('Elâh)§ is estimated at

* This is confirmed by Burckhardt, who says that "to describe the Wahaby religion would be to recapitulate the Muselman faith," and that "the 'Olema (of Cairo) declared that they could find no heresy in the Wahabys."—'Notes on the Bedouins,' vol. ii. p. 112, 113; and see 'Materials for a History of the Wahabys,' p. 95, et seq.—A.

† The lever at the other end is furnished with a counterweight which nearly balances the weight of the bucket full of water. The water-drawer stands at the edge of the well with the rope sustaining the bucket in his hands, and alternately pulls the lever down by it until the bucket descends into the well, and jerks the bucket, when full, up again to the brink of the well, whence it is emptied into a trough from which the water is conducted by a channel to its destination.—A. This contrivance is the same as that represented by Norden (Travels, pl. liii.), and Niebuhr (Travels in Arabia, Tab. xv. No. iv.). It is also very characteristically represented in some of Mr. Bonomi's beautiful illustrations of his tracts on Egypt and Africa.—R.

‡ The Persian wheel, called pitcher-wheel (*roue à godets*) by the French. The same principle is applied in the dredging machines stationed in the Thames near Woolwich.—R.

§ Also 'Elâ ('Ela), W.—'Elâ is pronounced 'Alâ in most parts of Asia and Africa.—R. Niebuhr spells and pronounces the same word, *Elâ* (Descrip. de l'Ar., p. 325).—A.

2 days and a half in a south-westerly direction. There is no water along the road, except, after rain, in pools and cisterns. The inhabitants of 'Elâh, I was told, are about 300 families, including a great many Mutawallidin; they chiefly occupy themselves in a small trade which they carry on with the Bedouins of the adjacent desert and with the towns of Yanbu', Wagh, and Medina.

The only Arabian author by whom I have found 'Elâh mentioned, is Ahmed al-Dimashky, who, in his Akhbâr al-Duwâl, states it to be "a village on the Syrian pilgrim road, at a distance of 5 days' journey from Al-Medina, and situated in a valley possessing date plantations and a spring of running water." It is, however, out of the pilgrim's road, about 6 hours to the S.W. of Higr (Hijr), the fourth station from Tebook (Tebûk). The distance from Teimâ (Teimâ) to Tebook (Tebûk) is reckoned at 4 days' easy journey; half way there is a reservoir called 'Uklâ ('Uklah), where water seldom fails to be found. From Teimâ to Al-Gawf is 5 days in a north-north-easterly direction; and to Kheibar, 3 long days' journey.

The notices, I have been fortunate enough to find in Arabic works, of Teimâ, are few and meagre, and all amount to the same thing, viz., that "Teima is a town in the Syrian (sic!) desert belonging to the tribe of Tay, more fruitful in date-trees, and in a more prosperous state than Tebook; and that the castle of Ablak, attributed to Sam'ool (Sam'ûl), the son of 'Adiyâ ('Adiyah), stood here." There are no remains extant of this castle; nor does even its name live in the memory of the present inhabitants. A small ruined building, constructed of hewn stone and half buried in sand and rubbish, appeared to me to be too inconsiderable to admit of its being identified with the celebrated old castle.

The Bedouins dwelling in the neighbourhood of Teima are principally of the 'Enezê ('Anezeh) tribe. The most powerful clans of them here are the Fuḳarâ, the Wuld 'Alî ('Alî), the Wuld Soleimân, and the Bishr. The Fuḳarâ occupy the country between Higr (Hijr), Tebook (Tebûk), Khaibar, and Teimâ: their chief subdivision is the Benî Wahab. The Wuld 'Alî ('Alî) and the Wuld Soleimân generally live in the southern parts of the Nufood (Nufûdh), to the E. of Teimâ. And the Bishr, of whom the leading sub-division is called 'Awâgî ('Awâjî), are spread from these parts of the Nufood, which is here succeeded by a gravelly soil, as far eastward as Al-Kasîm. The Beni Shammar usually prefer the eastern parts of the Nufood, and the tracts near to Irak, whither during the last century they have been emigrating, clan after clan, and family after family. As, however, all these clans live in friendly intercourse, frequently encamping in the same place and mixing together, it is difficult to determine

the boundaries of their territories. Towards the close of spring, when water and pasture are scarce in the Nufood (Nufúdh), every tribe draws nearer to its own town or village, and in the time of the date-harvest they generally pitch their tents close to the walls of their respective towns.

1848.
Apr. 26. On the 26th of April I left Teimâ with an 'Awâgy Bedooin of the Bishr clan, who, having travelled from Hâil (Hâil) to Egypt as a guide to a party of men sent in charge of twenty horses for 'Abbâs Pâshâ, was now returning to his home. At the distance of 1 h. S. of Teimâ we passed the solitary peak of Ghuneim, and leaving it on our right hand entered on an open tract called Sanâniyé (Sanâniyeh). After travelling without any halt for 15 hours over this tract, and a continuation of it called al-Khawlá (Khaúlâh), we came to an encampment of the Fuḡarâ Bedooins, consisting of more than 200 tents pitched at the foot of a solitary sandstone hill named Gabal Bird.* As far as the darkness would allow me to observe, for the greater part of this journey was made in the night, our way passed over an unbroken plain bounded on the N.E. by Nufood ranges, and extending to the S.W. without visible limit. The Nufood was, as well as I could guess, about 5 hours from our route, and had the appearance of the declivity of a sandstone range of hills rising above the western low land, and running from N. to S.

Apr. 27. We spent the whole of the following day in the tents of the Fuḡarâ Bedooins. In the evening we were joined by a party of men from Egypt, where they had been sent at the end of the preceding year by Ibn Sa'ood with horses for 'Abbâs Pâshâ; they were now on their return to Riîâḍ (Riyâḍ), the residence of their chief, and had with them a slave sent by the Pâshâ to make further purchases of Negdî horses.

Apr. 28. On the 28th we all joined company, and started from the tents escorted by one of the Fuḡarâ sheikhs and a party of Bedooins. Our road continued through the land of Khawlá (Khaúlâh) in an E.S.E. direction, over plains of soft sand intersected by low hills and outlying masses of sandstone. The general aspect resembled that of Al-Hismâ, but a gradually increasing undulation of surface marks the transition to the Nufood. We were travelling this day only for 7 h. and 10 m.

Apr. 29. On the 29th, after proceeding for 1 h., we reached a pool of water, called Mugheirâ (Mugheirah), and in 3½ h. more came to the southern declivity of the Nufood land. Our road was now a constant succession of ups and downs over undulations of soft and loose sand. 2½ h. further on, we reached an isolated sandstone-hill called 'Irnân (Irnân), which contains a reservoir of water

* Bird, cold.—R.

named 'Enz. After travelling for 6 h. more we made a halt for the night.

On the 30th our course was, for 1 h., S.S.E. along the side of another detached sandstone-hill called Mismà. Beyond it commences a comparatively level low land, gently sloping into the extensive valley of Warik (Warik) or Ghawṭā (Ghawṭah),* the generic name for this kind of land. We travelled along this valley with a course due E. for 14½ h. 1848.
Apr. 30.

On the 1st of May we came in sight of the two celebrated granite ranges of Tay† Agâ (Ajá) and Selma (Selma), the most remarkable in this part of Arabia. Our course lay towards the former; and, after a march of 9 h. and 40 m. we reached the town of Mawḵak (Maḵak) at its foot. We had gradually passed from the soft and loose land to the before-mentioned hard gravelly soil peculiar to the land of Gabal (Jebel) Shammar and the southern parts of Negd (Nejd). May 1.

On the 2nd our way lay in a valley running E.S.E., and passing through the entire breadth of the chain of Agâ (Ajá). We travelled through this valley in 9 h. 20 m., and then entered the plain, which, under the general name of al-Baṭīn (al-Baṭín), extends between the two mountains of Tay, and, properly speaking, constitutes the land of Gabal Shammar. We rested here for the night, near Kafâr (Kafâr), the largest town in the land, and one of the chief abodes of the remaining descendants of the ancient Bení Temím (Temím).§ May 2.

On the 3rd, after a journey of 3 h. in an easterly direction, we reached Hâil, the residence of the chief sheikh of the Bení Shammar, and a sort of metropolis of their country. May 3.

* That is, a deep, well-watered valley, receiving streams from all the enclosing hills. Such receptacles, originally perhaps lakes, are peculiarly fertile and delightful in hot countries: hence the celebrity of the Ghawṭah of Damascus.—R.

† The second family of the children of Kahlân are the tribe of Tay. At the dispersion from Yaman, caused by the inundation of 'Aram, Tay (the father of the tribe) went unto the high parts of al-Higâz [bi Negdî al Higâza], in the mountains Agâ and Selma; and they are known as the two mountains of Tay even to this day. And as to Tay, he is 'Udad, the son of Zeid, the son of Kahlân the son of Sabâ, the son of Yashhab, the son of Ya'rab, the son of Kaṭṭan.—Abou-l-Fedâ ad cal. Poc. Spec., pp. 475-555.—A.

‡ Baṭīn, dimin. of Baṭn, and meaning, like it, a belly, i.e. in the present instance, the land which forms a belly between the two ranges.—A.

§ The Bení Temím are for the greater part husbandmen in Negd; their principal place of abode is al Hawtâ, a village five days journey from Derayé, southerly, in the direction of Wâdî Dowâsir, and the birth-place of Abdu-l-Wahhâb, the founder of the Wahhâbiyyé. Another colony of the Temím inhabit the town of Kafâr (mentioned in the text), and are the descendants of families who fled from Hawta to escape the consequences of the blood revenge. A third colony are husbandmen in the villages between Haly and Mashad 'Aly. The Bení Temím are noted for their lofty stature, broad heads, and thick beards; characteristics which distinguish them from other Bedouins. Abdu-l-Wahhâb is of the Temím clan, called al-Wahhâbî.—Burekhardt, Notes on the Bedouins, vol. ii p. 97.—A.

Our course in going from Teimâ to Hâil had been very circuitous in consequence of our having taken a direction too much to the S. on starting from Teimâ. The usual route to Hâil is nearly E.S.E., past the high hill of Hulwân* on the border of the Núfood, about 8 h. from Teimâ; and the distance between the two places is commonly estimated at 5 days' journey by a camel.

Reports of disturbances in the territories of Ibn Sa'ood (Sa'úd), coupled with other considerations, made me give up for the present an intention I had formed of visiting the eastern parts of Negul as far as the Persian Gulf, and I decided on taking the road to Baghdâd (Baghdád).

The communication between Gabal Shammar and 'Irâk is by two different routes; the more direct has a N.N.E. by N. course, and though ill-supplied with water, and more fatiguing, is generally preferred, as being more secure, by small parties and the peaceable karawâns who resort to 'Irâk for purchasing corn and rice. The other road at first has a more easterly direction, but is afterwards nearly parallel with the former. It is well supplied with water at almost every station, and, in consequence, much frequented by Bedooins, which makes it less safe, and it is seldom followed except by large karawâns and strong parties proceeding on warlike expeditions.

The Mesopotamian pilgrims of the Koofâ (Kúfah) karawân take this road in their journey from Mashad 'Aly to Mekká (Mekkah), and its length, at their rate of travelling, is estimated at 11 days. The wells on both roads, as well as all ancient villages and buildings in this land, are ascribed by the 'Arabs to Suleimân ibn Dawood (Solomon the son of David), who is supposed to have built them, with the aid of the Gân (Genii), placed by the Almighty, according to Muhammedan belief, under his power. In more modern times, the Lady Zubeidé, the celebrated consort of Haroon al-Rashîd, is said to have rebuilt the wells on the Koofâ (Kúfah) karawân road, and also to have erected kârawânserâis, but of the latter no vestiges are now to be seen.

As the party with which I was to travel consisted only of five Bedooins, proceeding to Mashhad 'Aly ('Alí) in order to purchase rice, of which their tribe was much in want, we decided on taking the more secure, but more difficult route, and started on the 7th of June from the small village of al-Gadhamiyé (Jadhámiyeh), distant about 6 h. N.N.E. of Hâil (Hâil). Our course, for 5½ h., was N.N.E., over a plain of nufood, called Dakky. This plain is bordered on the N.E. by Gabal Keisy (Jebel Keisí), a low sandstone ridge stretching from N.W. to S.E. On our left, or to the W., was the terminating part of the granitic chain of Âgâ (Ajâ), which here ends in irregular descents, at some hours distance W. of Gabal Keisy; and almost in the horizon, behind

us we saw the high single peak of al-Gidádiyé (Jidádiyeh). Beyond the Keisy ridge begins the plain of al-Khattá (Khattah), situated, as the Bedooins say, between two nufood lands. We crossed al-Khattá (Khattah), in a N.E. direction, in 7 h., during which we passed, nearly in the centre of the plain, a very deep well, called Bir Tayim (Bir Tayyem). In summer this land is inhabited by the Şulabá, the most despised clan of the Heteim.

On the 8th we again crossed a tract of nufood, but much less undulating than usual. After passing through it for 9½ h. we came to a well called al-Atwá (Atwa), about 50 fathoms deep, as my companions said, built of hewn stone, of good, and evidently very ancient, workmanship. Having continued our way for 4 h. more, we stopped to rest for the night. In the course of to-day's journey we passed some hillocks which appeared to be mere mounds of loose sand, known by the general name of Ta'oo's (Ta'ús).*

On the 9th we passed by low ranges of sandstone hills called Şeílá (Şeilah), the first, with the exception of the mounds of sand of yesterday, we had seen since leaving Gabal Keisy. At the distance of 3 h. from Gabal Şeílá we reached the boundary of the nufood, and gradually descended to a tract of firmer sand; and, 4 h. further on, entered the land of al-Hamâtiye, where we found a little water in cavities in the limestone rock. On our left, or to the W., we had now the land of al-Hayâniyé (Hayâniyeh), where water is also found, my companions told me, in similar receptacles; and on the right, at a distance of one day's journey, due E., is the land of Leiná (Leinah), through which the Koofá pilgrims pass. It is much frequented as a place of encampment by the surrounding Bedooins, as water is found abundantly in wells† at a small depth from the surface. After a march of 3½ h. more, we stopped for the night.

On the 10th, 3 h. and 20 m. brought us to a ridge of sand called al-Dāhāná (Dahanah), which is considered as the parent stock and as constituting the N.E. boundary of the nufood. This ridge extends from near al-Gawf, from which town we were distant nearly 4 days eastward,‡ without interruption, as far as 'Amood al-Kheimás§ ('Amúdu-l-Khaimah), on the shore of the Persian Gulf. The other ridges and spurs of the nufood all gradually diminish in height as they descend towards that sea, and are more or less broken by intermediate tracts of a different soil, and terminate before they reach the shore. On the other side of al-Dāhāná,

* Ta'oo's—peacock.—R.

† These wells are even mentioned by the author of the *Kamoo's* [Kamús] as having been made by Sulaimán ibn Dawood.—W.

‡ Sic: but *qz.* about S.E. by S. ?—A.

§ Or Rásu-l-Khaimah, Cape Tent, well known by the defeat of the Jawáthimah pirates stationed there in 1809.—R.

towards the Persian Gulf, however, tracts of the soft nūfood sand occasionally occur; but have no longer the peculiar character of the higher levels which occupy the centre of the northern desert lying between Syria and Mesopotamia.

We crossed al-Dahanā* in half an hour to the land of al-Ḥāḡārā (Hajarah), extending from al-Dahanā to 'Irāk. This is, as its name implies, a hard stony tract; its surface presents an unvarying succession of broad ridges, like waves, alternating with gravelly plains, without a single hill or other prominent object above the undulating level to relieve to the eye the dreary monotony of the desert-sea, or serve as a land-mark to the traveller on his way. Our general course from Gabal Shammar had been nearly N.E., but from this place "we took the pole-star between our eye-brows," to use the Bedouin phrase, and struck a course due N. After a journey of 7½ h. we halted for the night.

On the 11th we reached, after travelling 9½ h., some wells, called Hazil, about 20 fathoms deep. They were all lined with hewn stone, similarly to that of al-Aṭwā. We proceeded for 1 h. 40 m. more, and then lay down for the night.

On the 12th our journey was continued for 13½ h. We passed on this day various low ranges, either of limestone or conglomerate sandstone.

On the 13th, after a march of 2½ h., we descended into the low plain of al-Magāmīr (Majāmīr). Its sandy level was studded over with hummocks of agglutinated sand, rising to the height of the adjoining land above. 5½ h. more brought us to the district of al-Musheikīk (Musheikīk), where we expected to find water, but as the summer was so far advanced that the cisterns were empty, we were obliged to continue our journey through the whole day without a drop of water to relieve our thirst. After travelling on for 7 h. 20 m. we stopped for the night.

On the 14th, at the end of 5 h., we reached the cisterns of Samīt (Sāmīt), filled our water-skins, and continued our journey for 8½ h. before we rested for the night.

On the 15th we reached the northern limit of the land of

* Dahanā signifies, according to the author of 'Al-Kāmoos,' "desert, in general" (falāṭ): it is also the name of "a land belonging to Benī Temīm in Negd," which land may be taken, I think, to be the ridge of sand we here crossed. The present inhabitants use dahanā, or, after their pronunciation, dāhāna, in the same sense as they do the word baṣṣā, in certain phrases in the signification of sand, but which properly means a place with a gravelly sandy surface somewhat depressed, so that water from higher ground occasionally collects upon it; I cannot, however, remember having heard dāhāna given by them as a name for the whole of the vast desert of Nūfood, as it sometimes seems to be, by the Arabian geographers, and by M. Caussin de Perceval. The general and almost only name in use at the present day for this extensive tract, is Nūfood, which word is also used for expressing the idea of a soft, sandy soil in general; although, I must allow, that I have found no authority in the old literature for this last signification.—W.

al-Hagará (Hajarah), and entered an open valley, where we found some verdure in the small acacias, called in Arabic Sidr. We crossed this valley in 4½ h., and came to the plain of Gufrát al-'Irāk (Jufratu al-'Irāk), near the small village of Kaṣr al-Ruheimy (Kaṣru-l-Ruhaīmi), whence our course was directed to the gilt cupola of the mausoleum of the Imām 'Aly ('Alī), which was visible on the horizon. In our road over a crisp sandy soil, we crossed the dry bed of the old canal of Shâpoor (Shâpūr);* we then passed through a defile in the insulated hill of Gabal Sanām (Jebel Sanām), and after a forced march of 12 h. without stopping during the night, reached Mashad 'Aly,† the end of our journey.

APPENDIX TO DR. WALLIN'S PAPER.

NOTE.—*Sweis*, p. 1.

In a foot-note to Wellsted's account of Arabia, at p. 51 of vol. 6 of this Journal, 1836, *Sauweis* is stated to signify "a little moth," as if the word, in consequence of its being of the diminutive form of "*sas*," a moth, or, more properly, a weevil, had been adopted for the name of this town. It is not mentioned upon what authority so casual an etymology is suggested; nor has a reference to the various memoirs in the 'Description de l'Égypte,' and to the classical and some Arabian geographers, and other writers, resulted in satisfactory information upon the origin of the present town, or the reason of its being called *Sauweis*.

Amid the general obscurity which surrounds the comparative geography of the places which have succeeded each other as commercial ports to lower Egypt at the head of this arm of the Red Sea, all that can be adduced within the compass of a note is as follows.

Pithom (Ex. i. 11), Patoumos (Herod., ii. 158), and Heroopolis (Strabo, Geog., lib. 16, p. 768, &c.), are the earliest names with which history acquaints us; but whether of the same town, or of different towns, and whether situated near the present head of the gulf or towards the head of the Bitter Lakes, are questions that have been much discussed, but not settled, by the learned. A useful indication, with authorities, to what has been written on the subject, will be found in Malte-Brun (Geogr., Transl., London, 1823, vol. iv. p. 50). The *Daneon Portus* and *Charandra Sinus* of Pliny (Hist. Nat., lib. vi. c. 29) were, as the terms imply, names for bays or anchorages, and are supposed to have been near the present *Sauweis*. The next names in the series of towns are the Heroopolis of Ptolemy (lib. iv. c. 5)—if in reality, as Malte-Brun supposes, it be a second town of that name;—Arsinoë or Cleopatris (Strabo, lib. xvii. p. 804, ed. 1707. Plin. ut supra, &c.); Clysma (Ptol., lib. iv. c. 5); Kûlûdm (Yakûtu-l-Hamawy; Kamis, &c.); and *Sauweis*. These last mentioned towns, whose joint æra extends back through a period of 2300 years, are supposed to have been situated very close to each other. Arsinoë, built by Ptolemy Philadelphus in the third century B.C., is mentioned by Ptolemy the geographer, in the second century A.D., or upwards of 400 years after its foundation, as then still a town, and as situated 20 miles to the N. of Clysma (lib. iv. c. 5); and this last place, Bochart (Pinleg, col. 107, sub v. Clysma) supposes to have sent a bishop to the Council of Chalcedon in 451 A.D. Dean Vincent ('Commerce, &c. of the Antients,' vol. i. p. 522) considers Kûlûdm to be an Arabic corruption of *αἰλίωμα*, which seems to imply a place by the sea-shore; although Bochart (ut supra) had suggested that it ought to be written *αἰλίωμα*, or *αἰλίωμα*, from *αἰλίω*, to

* Shah-Poor—the son of the king.—A.

† The place of 'Alī's martyrdom.—R.

shut, in reference to its assumed position as a port at the entrance of the famed canal across the isthmus. The author of the *Kamûs* and other writers, however, derive the name of *Kûlzum* to this town and the adjacent sea from its Arabic signification, "to swallow up," in allusion to Pharaoh's host having been swallowed up by the waves near the same spot (*Abu-l-Fedâ*, in '*Descrip. de l'Eg.*' tom. xi. p. 366; *Ben Ayâs*, idem, p. 367; *Kamûs*, in v. *Kûlzum*; *Golius*, in notis ad *Alferg.*, p. 88). In 997 A.D. (*Al Mesîhhy*, in '*Descrip. de l'Eg.*' tom. xi. p. 387) *Kûlzum* appears to have been the place where the dues on vessels were levied; but *Yâkûtu-l-Hamawî*, in his book '*Ma'aganmu-l-Buldân*,' written in the beginning of the thirteenth century, or 230 years later (sub v. *Kûlzum*), states that "it was (then) a ruin, with a gate, and that a place near to it, called *Suweis*, had become the port, and that it also was like a ruin, and had not many inhabitants."

In the *Kamûs*, and in the European lexicons, with the exception of *Meninski's*, where *Golius*, in notis ad *Alferganum*, is cited, the word *Suweis* does not occur. All that *Golius* says in the above work (pp. 88, 184) is, that *Suweis* succeeded *Kûlzum* as a port to lower Egypt. In the notice of *Suweis* by *M. J. M. Le Père* (*Descr. de l'Eg.*, tom. xi. p. 170) is a passage, of which the translation is,—

"The town of *Suweis* has succeeded to that of *Kûlzum*, of which the ruins exist a little to the north. Under the Ptolemies it bore the name of *Arinœ*, or *Cleopatris*; and under the Arabs took that of *Kûlzum*, as may be seen in *Makrizy* and *Ben Ayâs*; and, since, that of *Suweis*. We are ignorant of the etymology of the word *Suweis*. May not the Arabs, who have given this name to the present town, have considered the district of *Kûlzum* as an *oasis*, a word which they pronounce *Sonyeh*, and which Europeans have rendered by *Suweis*. Nevertheless, various Arabian authors, and particularly the geographer 'Abdu-l-Nasbid al-Bakûy (in 1412) expressly distinguish *Suweis* from *Kûlzum*." In a foot-note it is added, that "*Makrizy*, in speaking of the oasis of Ammon, expresses himself thus:—"*Santaryeh* is at the present day a very small district, which is called *Sywâh*, and which the Arabs pronounce *Sûyeh*;" and that, according to the learned orientalist *M. Laugel* ('*Voyage de Hornemann*,' tom. ii. p. 343), the etymology of the word *Syweh* is to be sought for in the Egyptian word *swêh*, which signifies an inhabited place in the desert, and which the Greeks have hellenized into *oasis*."

According to al-Bakûy (idem, tom. ii. p. 369), *Suweis* was surnamed al-Hagar, or the stony, or rocky, from the aspect of its locality. *D'Herbelot* (*Bibl. Orient.* in v. *Sous*) states the word to be either *Sous* or *Souis*. If he is right, and if al-Hagar may be taken as a distinguishing appellative, the name, after all, may be the same with that of the towns of this name in *Khuzistân*, *Morocco*, *Tunis*, and other places, and the diminutive noun *Suweis* would then signify "Little *Sûs*." *Stephanus* (in v. *Susa*, cccclvi., vol. ii.) associates the etymology of this word, as the name of the ancient *Susa* in *Khuzistân*, with the Greek word *swros*, a lily, which he states to be of Phœnician or Phrygian origin; and *Sûsan*, *Susân*, and *Shûsan* signify a lily in Turkish, Arabic, and Hebrew, respectively. The ancient city is likewise supposed to have been named from the old Persian word *Shûs*, pleasant (*Col. Kinneir's* 'Geogr. Memoir of the Persian Empire,' p. 100, et seq.). Beyond these vague suggestions, I have been unable to find anything illustrative of the origin or of the name of the present town of *Suweis*.

The inhabitants of *Suweis* have a tradition, that in the early ages of Christianity the site of *Suweis* was occupied by some Arabs only, who lived by fishing and smuggling (*Descr. de l'Eg.*, t. xi. p. 171).—A.

NOTE.—*Tidal Flats*, p. 1.—The Gulf of *Suweis* extends in a N.N.E. direction for some distance above the town. There is a considerable variation as to the actual limits of the gulf on the maps. The latest map, and that which should be the most authentic, namely, that embodying the results of the surveys of the Red Sea executed between 1830 and 1833, terminates the gulf in a confused line at *Suweis* itself; and the supplemental sheet of the northern harbours exhibits the head of the gulf at about 2000 yards, or a nautical mile, to the N. of the town. The map accompanying the report of the engineers who examined the Isthmus in 1847, with a view to the re-establishment of a canal, affords no certain view of the head of the gulf. The French plan of the port of *Suweis* (*Descr. de l'Eg.* E. M., vol. i. pl. II.), which is on a larger and more detailed scale than the others, places the

extreme limit of extraordinary tides at about 10,000 yards, or 5 nautical miles, and of ordinary high tides at $3\frac{1}{2}$ nautical miles to the N.N.W. of the town. The ruins of Kûldûm are about half a mile to the N. of Suweis, on the same or western shore of the gulph; and a little above these ruins, or about a mile northward of Suweis, the gulph is fordable at low-water; and at that state of the tide this route is generally taken by the Arabs and travellers passing to the opposite shore. At other times the route is round the head of the gulph, joining the way from Agerûd, which passes at about 4 miles to the N. of the town, and then by the head of the gulph between the line of ordinary and extraordinary tides, and therefore across the flat sands which are occasionally overflowed.

A great geographical question has been raised as to whether the Red Sea did, or did not, formerly, flow up beyond its present line of demarcation into the depression or basin known as the bitter lakes, and which is separated from the northern extremity of the sea by a bank about 7 miles wide, rising in no place more than $2\frac{1}{2}$ feet above the mean high tides, and scarcely at all above the highest tides. (*Société d'Etudes de l'Isthme de Suez, Rapport de l'Ingénieur, 1847, p. 48, and Descrip. de l'Eg. tom. xviii. p. 344.*) This basin extends north-westerly about 22 miles (nautical), with a breadth varying from 1 to 6 miles, and is, in the deepest part, as much as 57·86 feet Eng. below the level of high-water at Suweis according to the French levellings of 1799 (*Descrip. de l'Eg. tom. xi. p. 326, station 119*), or 34·71 feet Eng. by those of 1847 (*viz. 2·27 + 8·31 inches = 10·58 metres—Société d'Etudes de l'Isthme de Suez, Rapport de l'Ingénieur, 1847, pp. 25, 27-8.*)

The affirmative of this question is strongly maintained by M. du Bois Aymé (*Descrip. de l'Eg. tom. xi. p. 371, and tom. xviii. p. 341*), who is supported by M. Le Père (*tom. xi. p. 316 n., and pp. 326, 323*) and by D'Anville. M. du Bois Aymé bases his view upon the appearance presented by the lakes; the coincidence between the level of their former water line and that of the Red Sea; and the physical construction of the Isthmus, and particularly of the barrier between the lakes and the Red Sea (*tom. xi. p. 372, and tom. xviii. p. 354-61*); and upon the historic evidence of the distance of the head of the Red Sea from the Mediterranean, and of the position of the towns near it, as estimated from the ancient authors (*tom. ii. p. 372, tom. xviii. p. 362*); he even thinks that the sea may have covered these lakes so late as the reign of Hadrian, and possibly at the conquest of Egypt in 640 A.D. under the Khalifat of 'Umar, but certainly as late as the time of Herodotus.

The negative of the same question in all its details is maintained with equal force and more elaborate argument by M. Rozière (*tom. vi. pp. 258, 273, 275, 285*), and, after him, by Malte Brun (*Geog. Eng. Transl. vol. iv. p. 49-57*), and by the engineers who examined the Isthmus in 1847 (*Rapport, pp. 46-9, 75, 79*). These authorities hold that there has been no material change in the Isthmus of Suweis within the historic period, and that although the lakes may have been filled with sea water, their now being cut off from the sea is due to a geological disturbance. The levellings, if correct, effected by the engineers of 1847, prove the northern barrier of the lakes, near Mûkfâr, to be about 5 feet higher than the operations of 1799 made them (*Rapport, p. 28*), and, consequently, as much above mean high water at Suweis, so that the northern would be at least as sufficient as the southern barrier, which, as has been mentioned, is not more than $2\frac{1}{2}$ feet above ordinary high tides (*Rapport, p. 48, and Descrip. de l'Eg. tom. xviii. p. 344*), for preventing the flow of the sea beyond it. A main point on the negative side of the argument, before the results of 1847 were known, was, that if the Red Sea had ever filled the bitter lakes, it would have overflowed the barrier at their northern end, and found its own way to the Mediterranean; but now, consequent upon those results, the late engineers lay more stress upon the opinion that the formation of both the northern and southern barrier (the last, be it recollected, separating the basin of the lakes from the Red Sea) are geologically similar to, and contemporaneous with the lower tertiary formations which compose the Isthmus and the flanks of the adjoining hills (*Rapport, p. 47*).

If such really be the case, how came, it may be asked, the bitter lakes to acquire their present shaped basin? That they have at some former time been filled by the sea, all who have examined them appear to be agreed upon; and, further, that at an early epoch they constituted, in the form of a long narrow inlet contracted at its mouth, near Suweis, the head of the Red Sea. Now, on the latter part of this hypothesis, it will necessarily follow that the formation of the southern barrier, which

at present cuts them off from the Red Sea, must have been subsequent to that of the northern, and not contemporaneous with it: that argument therefore fails. On the former part of the hypothesis, if the Red Sea once joined the Mediterranean, and the lakes were formed by a sudden and contemporaneous upheaving of their northern and southern barriers, how is it that no similar trace of a once water covered surface is found to the N. or rather N.W. of the present northern barrier?

These last considerations show that the question is not determined; and, considering the importance to commerce of a way across the Isthmus of Suweis—an importance scarcely second to that connected with the Isthmus of Panama,—and of the various points in the historical geography of the Isthmus dependent upon a right ascertainment of its ancient limits, a great service would undoubtedly be rendered by some future traveller properly qualified, devoting himself to a thorough examination of the head of the Gulph of Suweis and its adjacent inland basin. It does not appear in any of the accounts consulted in the course of this note, that the shells found along the ancient water line of the lakes, and about their bottom, have ever yet been compared with those in the adjacent sea.—A.

The various memoirs in the 'Description de l'Égypte,' bearing upon the comparative geography of the Isthmus of Suez, are, 'Des Antiquités dans l'Isthme de Soueys,' par M. Devilliers, tom. v. p. 133, with texts of Greek and Latin authors cited, pp. 325 and 381; 'De la Géographie Comparée et de l'Ancien Etat des côtes de la Mer Rouge,' par M. Rozière, tom. vi. p. 251; 'Sur la Communication de la Mer des Indes à la Méditerranée par la Mer Rouge et l'Isthme de Soueys,' par Mr. J. M. Le Père, tom. xi. p. 37 (in which is an interesting notice of Suweis, p. 169; and extracts, with translations, from various ancient and modern authors on the subject of the canal, &c., p. 362); 'Sur les Anciennes Limites de la Mer Rouge,' par M. du Bois Aymé, tom. xi. p. 371, with Appendix, tom. xviii. p. 341, and map, tom. viii. p. 76. M. du Bois Aymé maintains, in opposition to M. Rozière, that the waters of the Gulf of Suweis extended to the head of the lacustrine basins immediately beyond the present northern limit of the gulf within the historic period.—A.

Islām Jurisprudence, p. 300.—The Islām Code, upon which rests the whole body of Muhammedan legislation prevailing in the Turkish empire and other Sunnī states, has been founded by later doctors upon the statutes of the rites of the four Imāms, Abū Hanīfē, Malék ibn Anṣ, al-Shāfiʿī, and Aḥmad al-Hanbalī, who, though differing in some points respecting the modes of external worship, morality, and the civil and political administration, are completely of the same opinion with regard to the dogmas and all the articles of faith. This code is considered as a collection of religious laws all derived from four books, viz. 1, the Korān; 2, the Hadīth or Sunnī, i. e. oral law or precedent; 3, a collection of explications and decisions of the apostles and principal disciples of the prophet, particularly the four first Khalīfās; and 4, the Kllās or collection of canonical decisions by the Imāms' interpreters in the first ages of Islāmism.—A.

List of Arabic Authors and Books quoted in the foregoing Paper.

Abū-l-Fedā.—*Imaʿil bin ʿAlī bin al-Sultān al-Muḥaffar bin al-Sultān al-Mansūr bin al-Sultān al-Muḥaffar Ṭahkū al-dīn ʿAmrū ben Shāhīnshāh bin Ayoob ben Shāhīdī*, Lord of Hamāh, known as Abū-l-Fedā, was descended from the same ancestor as Salāh al-dīn, who was the son of Ayoob above mentioned. Abū-l-Fedā reigned for three years as Sulṭān or Prince of Hamāh in Syria, after his brother, who was deposed in the year 743 of the Hīgrā. Upon assuming his government he took the title of *Maliku-l-ṣalīh (the Upright King)*. He is said by some historians to have been born in the year 672 (1273 A.D.), and to have died in 732 (1331 A.D.), but there is doubt about the precise period when he lived. He is the author of two considerable works; the first, entitled *Takwīm-u-l-Buldān—a Table of Countries*, is a geography disposed by tables according to the order of the climates, with the degrees of latitude and longitude; the second is an abridgment of universal history to his own time, and entitled *Al Muḥtassar fy akhbār-i-l-basharī—An Epitome of the History of Mankind*. It is from this last work that the excerpts at the end of Pococke, ed. 1806, are taken.

Ahmad al Dimashky.—Ahmed bin Yoosuf bin Ahmad Abou-l' Abbés, surnamed *al-Dimashky*, wrote a universal history entitled *Akhbār al duwal*—*The History of the Changes of Fortune* (divided into fifty-five sections, with a long preface), which was finished in the year 1008 of the Higrá (1599 A.D.).

Alferganus.—The author known to Europeans by this name is *Muhammed bin Kathir al-Farghāny*, called *al-Farghāny* (*Alferganus*) from his being a native of the province of Farghān, on the N.E. of the Oxus. He flourished about the year 184 A.H. (800 A.D.), and wrote a work on astronomy, which has been several times printed in Europe; but the most valuable edition of it is that by Golius, with geographical notes on all the places mentioned by the author, published at Amsterdam, in small 4to, in 1669.

Ibn al Athir.—There were two brothers of this name, both authors of great learning and repute. The one quoted by Dr. Wallin I presume to be *Abou-l-Hasan 'Aly ibn Abi-l-haram Muhammed ibn 'Abdi-l-Karim al-Sheibāny*, known as *Ibn al-Athir al Gazary*, from his being a native of a place called *Gazirāt ibn 'Umar*, on the W. bank of the Tigris, in Mesopotamia, and surnamed *'Azu-l-din*. His greatest work is entitled *al-Kāmil*, i. e. "The Perfect" or "The Universal [History]," which begins with the creation and extends to the 628th year of the Higrá (1231 A.D.). He was born on the 4th of Jomādhy al awal, of the 555th year of the Higrá (May 12th, 1160 A.D.), and died in the month Sha'bān of the year 630 (May, 1233 A.D.). The brother's name was *Abou Sa'ādāt al-Mubārak ibn Muhammed al-Sheibāny*, also known as *Ibn al-Athir al Gazary*, but surnamed *Magdu-l-din*.

Ibn Ayās (Abou 'Abd Allā).—The name of this writer is *Mohammed bin Ahmad bin Ayās*. He received the surnames of *Al-Hanafy* and of *Al-Gerkasy* from his being of the orthodox sect of Abou Hanifā and a native of Circassia. His work is entitled *Nash' al-Azhār fi 'Agāyb al-a'tar*—*Smelling of Flowers in Wonders of Countries*, and was finished, according to the author's own statement, on Friday the 14th of the month Sha'bān of the 922nd year of the Higrá (12th September, 1516 A.D.). It comprises a historical and geographical description of various countries, including a detailed notice of Egypt; the whole drawn from more ancient annals.

Al-Kalkashendy.—*Abi-l'Abbās Ahmed ibn 'Abd Allā al-Kalkashendy al Nisābe* died in 821 of the Higrá (1418 A.D.). His book quoted by Dr. Wallin is called *Nihāyetu-l-adab fy ma'rafati-l-ansabi-l-Arab*—*The end of Learning in a knowledge of the Genealogies of the Arabs*. Dr. Wallin, however, gives the title as *Nihāyetu-l-Arab fy ma'rafati-l-Kobāili-l-Arab*—*The end of what is necessary in a knowledge of the Arab Tribes*.

Kamooos.—*Muhammed Ibn Ya'koob Ibn Muhammed al-Sherāzy al-Firawzabādy*, the author of this well-known dictionary, called *Kamooos* and *Bahru-l-Muḥit*—*The Ocean (of the Arabic Language)*, was born 729 A.H. (1328 A.D.), at Kāzin, in the southern part of the province of Fars, and died at Zabīd, formerly the capital of the Tehāma of Yaman, in 817 (1414 A.D.). He was by birth a Persian, but lived mostly at Ṣana'a, in Yaman, and finished his dictionary—which is principally formed upon an earlier work, in sixty-five volumes, and upon the dictionary of *Al-Goolary*—at Mekká.

Kitāb al Buldān—*Book of Countries*. The author of this work is *Ahmad ibn Yahya al-Shā'ir* (the Poet). It consists of cosmography and history, and is much esteemed.

Al-Meiddīny.—*Abou-l-Faḥli Ahmed ibn Muhammed al-Meiddāny al-Nishāboory*, so called from Meiddān, a town in the district of Nishāboor (Nay-Shah-Poor), in Khawrasān. He died in the year of the Higrá 518 (1124 A.D.).

Musālik al-Aḥsār fy Mamālik al-Ampār—*The Ways of Sight in Territorial Dominions*, is the title of a historical and geographical work by *Abou-l'Abbās Shehībū-l-din Ahmed ibn Yahya*, who was born in the year 700, and died in 749 of the Higrá. There are also other books by him.

Muhammed al Sipāhi.—*Al-'Abdu-l-Fakir Muhammedu-l-Shahir bi-ibn al-Sipāhi*—*The Poor Slave Muhammed known as the Son of the Soldier*, died in 980 A.H. (1572 A.D.). His book here quoted is entitled *Avdāhu-l-Mesalik ila Ma'rafati-l-buldān wa al-Memālik*—*Light for the Road to a knowledge of Towns and Countries*, and is merely the geography of *Abu-l-Pedā* reduced to alphabetical order, with a few alterations and additions.

Al-Sana'any.—*Abou Sa'd 'Abd al-Karim ibn Abi Bakr Muhammed al-Sana'any*

al-Marwazy, so called from his being a native of the town of Merwa, in Khorasān, and descended from the Arab tribe of Sama'an. He is the author of a book of Arabian genealogies, in eighty-volumes, entitled *Ansāb—Races*, which contains all the genealogies that he could collect up to 562 of the Higrā (1166 A.D.). This book has been augmented to one hundred volumes by Ibn Athīr ('Az al-dīn). Al-Sama'āny was born in 506, and died in 562 A.H.

Al-Wākidy.—He was called *Abou Kāsim 'Alī ibn Hasan ibn Khalaf*, and wrote among other works a history of the conquests of Syria by the Muslims, under the title of *Futoohāt-i-Shām*; also of Egypt, under that of *Futoohāt-i-Misr*. His works are much esteemed by subsequent writers. He was born in the year 131, and died, aged seventy-four lunar years, a Kādī of Baghdād, under the Kbalifé al-Māmoon, on the 11th of the month Dhu-l-haggé, in the year 307 of the Higrā (May 26th, 823 A.D.).

Yakutu-l-Hamawy.—*Abou 'Abd Allā Ya'qut bin 'Abd Allā al-Hamawy*, a citizen of Baghdād, surnamed *Shihābu-l-Dīn*, was born in Asia Minor (Bilādu-l-Rūm) in the year 574 or 575 of the Higrā (1178-80 A.D.), and died in 626 (1228, 29 A.D.). His book, *Mu'agamu-l-Buldān—What is known of Countries*—is a geographical dictionary alphabetically arranged.—A.

APPENDIX.

XXII.—*Journal of an Expedition to Explore the Interior of the Middle Island of New Zealand.* By Mr. THOMAS BRUNNER. (Communicated by the Colonial Office.)

[Read 11th March, 1850.]

To acquire a better knowledge of the interior of the Middle Island, and especially of the parts more immediately connected with its own district, has always been a subject of much interest to the Nelson settlement. At a very early period it was felt that its future importance must depend upon the amount of available land naturally connected with it; and the success which attended the first efforts to enlarge its boundaries, by which it was put in communication with the Wairau Valley on one side, and with the Takaka and Massacre Bay on the other, led to the hope that some opening might also be found in the rocky barrier which stretches in one great semicircle from Cape Campbell to Cape Farewell, embracing the whole of these districts within it, and sending off from the central and highest part of its range the long mountain ridges which divide them from each other. Immediately behind this rocky wall, the extensive grassy plains of the E. coast were known to commence, whilst the same mountain chain was believed to extend, without interruption, along the W. coast to the southern extremity of the island. Lying among the snowy mountains of the central portion above mentioned, about 50 miles S.E. from Nelson, the Rotuiti, or Little Lake, discharged its waters to the westward; and from the mountains above Messrs. Henphy and Christie had looked down upon the plains of Port Cooper. A larger lake, the Roturoa, was reported to exist not far from the Rotuiti by two of the almost extinct tribe of the Rangitani, the former possessors of the country; and with one of them for our guide, Messrs. Fox, Henphy, and myself, visited it in the beginning of 1846. The waters of the Roturoa Lake, flowing to the N.W., were found to form a considerable river, the Kawatiri, or Buller, even at their outlet; and being soon joined by the river of the Rotuiti, took a great sweep to the south. Instead therefore of following the course of the river, we pushed across the mountains to the westward, and after crossing two valleys, the Tiraumea and Tutaki, came again upon the Buller, about 20 miles from the lake, where it runs for about 6 miles through a valley called Matakutuki. Here, swelled by the addition of the rivers Tiraumea and Tutaki, and also by the junction of a considerable

THE
MIDDLE ISLAND
(New Zealand)
to illustrate
M^r Brunner's Paper
1851.

0 10 20 30 40 50
English Miles



M^r Brunner's route is coloured Red



stream, the Matiri, which enters it from a large valley to the northward, nearly opposite the Tutaki, the Buller becomes a river of great size, varying in breadth from one-quarter to one-third of a mile, and again enters the mountain gorges. From this point we retraced our steps to Nelson.

A few weeks after our return I again started with Mr. Heaphy to explore the W. coast. On that occasion we crossed the mouth of the Kawatiri, which discharges itself into the sea about 6 miles N. of Cape Foulwind, or the Black Reef, and made our way nearly 60 miles further to the southward, to the native settlement, Arahura.

On returning to Nelson it was proposed to me to undertake another expedition, commencing from the furthest point we had reached on our excursion with Mr. Fox, and tracing down the Buller to its mouth; afterwards exploring the country still further S., and ascertaining the practicability of crossing the island in the direction of Otago or Akaroa. I engaged Ekehu, my previous travelling companion, and a friend of his, Epikewate, who were to receive their outfit, and 5*l.* each on our return. I found that they had wives, who insisted on going with them, so I had to incur the additional expense of providing an outfit for them also.

We started on December 3rd, 1846.—Mr. Empson drove me up to Mr. Duppa's, where I slept.

4th.—Walked down to Mr. Kerr's farm and saw my natives, who were staying there, but they would not move until the next day. Slept at Kerr's.

5th.—After some trouble in packing our loads we started for Mr. M'Rae's farm, where we stayed over Sunday.

6th.—Self and natives attended Divine service, and heard Mr. Butt.

7th.—Our loads being heavy, I employed a man to help me over the Motueka range, but halted at the Waiti.

8th.—Walked to Fraser's station in the Motueka valley, and discharged the man.

9th.—Stayed at Fraser's, who was from home, to get his mule to carry our loads to the Rotuiti.

11th.—Started on our journey, with Fraser and mule assisting to carry our loads. Walked about 6 miles up the Motupiko.

12th.—Walked about 2 miles up the river, past the junction of the Mapu and the end of the surveyed country.

Sunday, 13th.—In order to allow Fraser to return we walked on, contrary to my intention of keeping Sunday. We reached the grass of the Rotuiti, the mule having carried her load of 150 lbs. gallantly.

Monday, 14th.—The natives requested me to allow them to keep to-day as Sunday, which we all did.

15th.—Divided amongst us our mule's load, and crossed the river Rotuiti. Slept at our old house on the Pukawini, or Howard, a small tributary stream, where we took possession of a bag of shot left on our last excursion.

16th.—Walked up the Pukawini, but soon stopped, and built a house, being frightened by a shower of rain and a dull day.

17th.—All hands affected more or less with dysentery, and with difficulty reached our old sleeping quarters in the bush.

18th.—Crossed the hill at the head of the Howard, and reached the Roturoa about a mile from its outlet. Epika and wife and baggage paddled down to the river in our former canoe. Windy and cloudy all day.

19th.—Showery, with wind. Natives out eel-fishing. Rain at night.

20th.—The heavy rain towards evening compelled us to repair the old house built by Ekehu when here before.

22nd.—A heavy gale of wind prevented us from proceeding up the lake according to my wish and intention.

23rd.—Embarked on board our canoe. Came up to a remarkable fern-hill on the opposite side of the lake, and stopped there.

24th.—Paddled up nearly to the head of the lake.

— Day windy. Explored the head of the lake, and found it entirely surrounded by a chain of snow-capped mountains, with a good sized stream flowing into it from the southward. There is certainly no accessible pass from the Roturoa towards the E., there being no break in the hills, or rather snow-capped mountains. The Wairau was the old pass of the natives who formerly resided at the pa on Waimea Plain.

There is a fresh-water mussel abounding in the Roturoa, called the kaichau, which, boiled with the roots of the raupo, or bulrush, makes a palatable dish, and was the favourite meal of the celebrated savage Rauparaha.

With a very little expense a good track might be cut from the Motupiko to the Rotuiti Valley; the bush is open and clear, and the descent easy: distance about 6 miles. I am of opinion the Rotuiti is too cold and open for a sheep-run, and the grass much inferior to the Wairau.

In the Rotuiti Valley is found a species of spear-plant, called by the natives taramea, which is much valued by them. From its leaves they extract, by heat, a species of gum, which gives out a very pleasant and lasting scent. One seldom meets an old native that has not a bunch of feathers, in a bit of old blanket, scented with this gum, and tied about his neck.

25th.—Heard a report, like that of a great gun, about sunset last evening; this frequently occurred in the sequel. On one occasion, further down the river, the reports were so regular and continual that Ekehu said they were the guns of a ship in distress at sea. Kept Christmas.

26th.—Ascended a high hill to the N., whence I looked down upon the Rotuiti, with the expectation of getting a view to the E., but found it entirely shut out by the high snowy range. I could trace the outline of the mountains on each side of Blind Bay. The direct distance between the two lakes does not, I think, exceed 6 miles.

28th.—Raining all day, and the hills around covered with snow.

29th.—Collected a quantity of fern-root and paddled back to our former quarters on the opposite shore. Wind and showers.

30th.—Drying our fern-root and otherwise preparing for a start.

31st.—After securing our canoe we started for the bush by our former route to the Tiraumea Valley, but made a poor day's walk, owing to the heavy loads and the wetness of the bush.

January 1st, 1847.—Proceeded this morning at a good pace, when unfortunately Epike's old wife was suddenly missing. We retraced our steps but did not find her till the evening. She said she had been struck by the Taipo, and did not know what she was doing until she came in sight of the remains of our last night's fire.

2nd.—Reached the eel station in the Tiraumea, and camped for the night.

3rd.—Awoke this morning under a heavy shower of rain, which drove us from our quarters to seek a shelter, which we continued to make out of the bark of the manuka.

4th.—Staying under our bark shelter, the river too high for proceeding.

5th.—The river still an obstacle to our onward progress. I ascended the river, whence I could see the valley Tutaki and part of the Matukituki. A fine day.

The hills dividing the Tiraumea from the Tutaki are those to which the natives formerly resorted for the purpose of catching the kiwi and kakapo. These birds are now extinct here, having been destroyed by the wild dogs formerly belonging to the natives, but which have taken to the bush. Numbers of them are to be seen here.

At this place my two female travelling companions quarrelled and fought, their husbands taking part in the combat, and I had much difficulty in reconciling them, and persuading them to continue their journey.

8th.—The sun has again made his appearance, dispersed the clouds, and,

with the assistance of a south-wester, given us a fine day. Great fresh in the river. Collecting fern root.

10th.—Very fine and warm. I again ascended a hill to the southward, but could see nothing but hills, or rather mountains, all round.

11th.—Started this morning to wade the river Tiraumea. We passed the Mai, or waterfall, once celebrated as a kakapo station. Two or more persons crossing a river will find it much easier and safer to hold altogether by one long stick, using both hands, and holding it on the palm, the elbow downwards, the strongest of the party up the stream. The quicker you walk the better, taking care to keep the step of the leader. It is a curious feeling, particularly to your feet, which, from the force of the stream and the slipperiness of the stones, seem scarcely to touch the bottom. Made a good day's march, the river being warm and clear, and a very fine day overhead.

12th.—The natives awoke me this morning to announce the approach of rain, which soon began to fall heavily, driving us from our quarters to wade the river in search of some hole or other place wherein we could stow ourselves, there being no materials for house-building on the spot. To improve my comfort I missed my footing and fell into a hole over my head. We found an overhanging rock, and managed to get through the night.

13th.—Walked to Ekehu's first wari in the Matukituki valley, on the banks of the Buller. The rocky gorges through which the Buller runs up to this point now cease for about six miles, and the mountains receding, leave a valley called Matukituki, into which open two others; the Tutaki, running parallel to the Tiraumea, and separated from it by a mountain ridge on one side; and the Matiri on the north; each contributing its river to swell the waters of the Buller. The Matiri is a valley of considerable size, and, from its length and direction, I imagine the mountains which form its upper extremity must be the dividing ridge separating it from the valley of the Takaka opening into Massacre Bay. Fine day.

15th.—Started for the ford where Mr. Fox was carried down, which we found much deeper than when we formerly crossed it; we all, however, reached the other side in safety, and proceeded to the next fall, which was much changed, and caused us all to drop our loads and look for another. We, however, could find none; so Ekehu agreed to go over first, and then return, if possible; he did so, partly swimming, partly wading. We then agreed to venture, all five holding our stick, taking off all our clothes, and securing our loads high on our shoulders: the river in some places ran just mouth high, with a powerful current. We, however, reached the other side, having well wetted our clothes and loads.

16th.—Walked on to my former return station, and repaired a house there.

17th.—Spent in drying our clothes and kits.

18th.—Finished making a kupanga, or net, which is about 50 feet by 4. In the evening took a draught of about fifty good-sized fish with it, called the upukuroro, or fresh-water herring.

19th.—Collected a quantity of the roots of the ti, or cabbage-tree, which we placed in a humu, or native oven, for the night. The natives prepare a very palatable dish of the ti and fern-root. They extract the sweet particles of the former by beating and washing it in a proper quantity of water, and when about the consistency of honey they soak in the liquid some layers of well-beaten and cooked fern-root, which, when properly moistened, is eaten, and has a similar relish to gingerbread. This can only be made when staying two or three days at a station. The root of the ti is the part used by the natives. It is generally from 2 to 4 feet long, and of a conic shape, with an immense number of long fibrous roots attached to it; so that the natives, whose tools consist of a pointed stick, and their hands, consider they have done a glorious day's work if they manage to obtain five ti roots in the day. It requires an immense oven, and to remain twelve hours baking. Fine day.

20th.—This morning opened our oven, which smelled like a sugar-boiling establishment. Found the ti excellent, but rather too sweet for a diet; however, this and the fish make a fine meal.

*21st.—Collecting fern-root. Collecting fern-root is very difficult, there being but a very small quantity eatable, and that the oldest, or deepest growth. Unfortunately my spade broke, so we had no tool but a pointed stick. Day showery.

22nd.—Drying our fern-root, and making straps and baskets for the better carrying our loads. Fine day.

23rd.—We have caught about 150 fish this week with our net, a great portion of which we have salted and dried for our future subsistence.

25th.—Having thus by a week's halt laid in a store of provisions, we packed our stores and kits and crossed the river again in the manner I have before described. We got our kits wet, redried them, and walked about 3 miles down the northern bank of the river. From this point the country was quite new both to myself and my companions, and I found the river assume an entirely different character, being deep and still, flowing over and between large granite rocks, and through a black birch country. Before, it abounded in eels, but we found none amongst the granite rocks, or anything else fit to eat in the black birch forest; neither were there any ducks, and but few other birds.

26th.—This morning the day looked dirty, and we almost determined to return to our old quarters in the Matukituki; but the general opinion was in favour of proceeding, and we therefore commenced climbing along our granite path. Towards the afternoon we had occasional showers, but we kept pushing on, and just before dusk reached a large ana, or hole in the rocks, where we put up for the night. The rain soon began to fall so heavily, that we were all afraid of being drowned in our shelter before morning by the rising of the river.

27th.—This morning at day-break we had to turn out of our cave, it being no longer safe, the fresh having risen to the threshold. We then built a bark house, and moved into it. Continual heavy rain. Having selected a dry spot for a house, we could find no materials for roofing it except the bark of the tawai, or black birch; this being heavy, requires a strong frame-work. To break the bark, Ekehu cuts it all round, and then with a chisel-pointed stick loosens it and breaks it off, which he generally does about 12 feet long. This bark forms a good roof when new, but soon curls with the heat of fire or a few dry days.

February 1st.—This morning the natives told me that the rain had so exhausted and spoilt our provisions, that as the country afforded none, it was necessary to return to the Matukituki station to replenish; so, after the wind had dried the bush, we started.

2nd.—Retracing our steps towards Matukituki, which the fresh in river rendered difficult.

3rd.—Crossed the river to our old house in the Matukituki.

4th.—Collected and made an oven of ti. The native Epikewati had a dream, which foretold the death of his wife by drowning while crossing the Kawatiri, and she took fright, crying and wishing to return to Waimea, to which I gave consent readily, but Epikewati would not agree.

11th.—We had to-day one of the heaviest storms of thunder I have ever seen, with a deluge of rain, and a tremendous fresh in the river.

17th.—Anniversary of the day Mr. Fox was washed off his footing, and had to swim the Matukituki with his load on his back. Drying timber and constructing raft. The day dull and showery.

The fruit of the kotukutuka, called konini, is a pleasant tasted berry, and is ripe about this month.

I am sorely disappointed in the appearance of the river during a fresh. I

expected something majestic, instead of which I see nothing but a dull, dirty-looking stream, running steadily along, with every now and then a large tree or quantity of brushwood floating on its surface. The natives tell me that the best time for working a canoe up or down the river is during a high flood.

18th.—Placed our kits of provisions on raft, and again crossed the river, and proceeded onwards. Fine day. In order to cross the river we had to resort to a new method. The fresh prevented us from fording, and we could not find enough timber for a raft to carry us, and the river runs too rapidly to admit of rafts re-crossing, so we made a small one on which we placed all our clothes, &c. The two fastest swimmers attached a small flax-line to the raft, and commenced swimming across; the remaining three swam behind, pushing the raft forward with one hand. For this method you must choose a reach of at least a mile long to cross the Buller when swollen.

19th.—Proceeded on our journey, and once again reached our ana, or former sleeping-place, when to our sorrow we were again visited with a deluge, and frightened to our old shed.

22nd.—Packed up our huge loads, mine consisting of a gun, 7lbs. shot, slbs. tobacco, 2 tomahawks, 2 pair of boots, 5 shirts, 4 pair of trowsers, a rug, and a blanket, besides at least 30 lbs. of fern-root. We made about 2 miles of very bad walking—granite rocks covered with tutu and brushwood. A shower at night.

23rd.—Showers of rain frightened us on. About 1 mile of fearful walking to an ana, where we found dry but most uncomfortable lodgings on an uneven surface of granite rock.

24th.—The appearance of the day was so far from fine, that we mutually agreed to stay in our dry quarters on account of our provisions, as fern-root once wet is spoiled, losing its flavour and becoming mouldy.

25th.—A shower of rain this morning prevented us from starting until about midday, when we accomplished about 1 mile, and encamped at an apparently good cel-station. My back very, very sore.

26th.—We had a little better walking part of the day, passing over about 1 mile of very good pine forest, but again came to our black birch country—precipices and granite rocks. I find in some parts of this at a fresh the river rises upwards of 30 feet. I am getting so sick of this exploring, the walking and the diet being both so bad, that were it not for the shame of the thing, I would return to the more comfortable quarters of the Riwaka Valley.

27th.—Worse and worse walking, the rocks being more steep and rugged, and covered with underbrush and quantities of brier, the bush almost impassable from the quantity of dead timber and moss. The evening showing for rain.

28th.—Built a bark house just in time to escape a heavy thunder-storm. Raining at night.

March 1st.—Morning fair. A heavy fresh in the river. The day soon changed into a regular soaking wet day. Consumed our last handful of flour to thicken a pot of soup.

2nd.—Steady, regular rain all day, with the wind N.E.

3rd.—Continued rain without any abatement until evening, when the weather appeared inclined to clear. Diet, fern-root served out in small quantities twice a day. This is without exception the very worst country I have seen in New Zealand; not a bird to be had or seen; and the few fish there are in the river will not bite during rain or during a fresh. We tried a species of the fern-tree called kakote, but it is far from palatable, and exceedingly indigestible.

4th.—Long showers of rain, with short intervals of sunshine.

5th.—The weather on the change, it is to be hoped, but not fine enough to venture forward.

6th.—Again made a start. One of the women so ill that Ekehu and self

had to share her load between us. We had the worst walking I have yet seen, on the side of steep precipices thickly covered with brier and underbrush.

7th.—Passed the day in a black-birch wood in company with thousands of sand-flies. I endeavoured to ascend a hill, but found it so steep and rugged that I relinquished the attempt. The banks of the river are so very perpendicular, that it is impossible to reach the water's edge; and the rocks affording no shelter for eels, we are badly off for provisions. I am resolved to pass the day as a Sunday, although much against the natives' wish.

8th.—Came along the river-bank about one-third of a mile, which distance took at least two hours to accomplish—hands, breech, knees, and feet being all actively employed. I do not think 10 paces of the whole distance were passed without securing a good hand-hold. The river then became impassable, and we had to ascend a ridge, which took the remainder of the day. Slept on the summit of the hill, which we found very cold lodgings. From this elevation I looked for a pass to the S. or E., but there is none observable. An opening or break in the mountain-range to the S.W. is observable, which I imagine to be the Inakaiona, Oweka, or pass to the Mawera, from its position corresponding with the opening Mr. Heaphy and myself observed from the Arahura, and from the description given me last year by the natives.

9th.—This morning I suffered about two hours of the most excruciating pain I ever experienced. The natives ascribed it to the fern-root diet. Feeling better, we all started, and walking a short distance along the summit, then descended a spur to the river, where we put up for the night. I really believe 2 or 3 miles is the utmost that could be accomplished, under the most favourable circumstances, on these short days in such a country. Large granite rocks heaped confusedly together all over the surface, with a thick growth of underbrush and briers, an immense quantity of dead and rotten timber, and all these on the steep and broken declivities of a range of high mountains, interspersed with perpendicular walls of rocks, precipices, and deep ravines, form a combination of difficulties which must be encountered to be adequately understood or allowed for.

10th.—The illness, I fear, is catching, for this morning my female companions declared their inability to proceed. I believe it is a species of influenza; however, be it what it may, they tried a novel kind of cure, cutting themselves all about the painful parts with a sharp stone, and then bathing in the river. We caught enough eels for a meal, and hope for better luck on the morrow.

11th.—Natives worse instead of better, but we managed to accomplish about a quarter of a mile to a fresh eel-station.

12th.—The illness of one of the women has settled in her leg, and she can only bring her toe to the ground. A dirty, showery day, and we lay under the nominal shelter of a large birch-tree.

13th.—Contrary to my experience on all previous days, the natives packed up for a start during a shower of rain, and we came on about half a mile, when it began to pour down, and the sick woman was not within hail; so Ekehu had to return and seek her, while Epika and self erected a shelter of the fern-tree. Ekehu and wife arrived just at dark, and the wind, changing its quarter, blew a gale, driving the rain and smoke of our fire under our shelter. We all passed a most miserable night, not having room either to lie down or sit up, and the woman moaning with pain.

14th.—Increased our shelter, which, but for the wind and rain, would be comparatively comfortable. Our fern-root almost exhausted, and no food to be found.

15th.—Proposed starting, but the natives refused, stating that the woman could not accomplish above half a mile a day; that the weather showed for rain, and that it was too much work building houses at such short distances. Showery.

16th.—I suppose the same arguments serve for to-day, as we are here still, and I am tired of urging our onward progress, for I only breed discontent, and do not carry my point; so I am determined, come what may, to become passive in urging them forward, although I do not relish gradual starvation on one meal of fern-root in twenty-four hours. I am afraid to quarrel with the natives, for I am told to look out for myself if I choose, and they will do the same.

17th.—No alteration in the appearance of the weather, or any apparent abatement of the illness of the native woman, yet they prepared for a start; so we all packed up, and, I think, managed to pass over rather a long mile of ground, and camped. Caught a meal of eels. The woman did not arrive until about midnight. I begin to fear her illness will cause us many days' hunger, if not real starvation, and I will not hear of the natives' suggestion of leaving her to her fate.

23rd.—Again made a start, and completed a fair day's work. The walking and general appearance of the country the same as usual. A shower of rain at sunset, and another about the middle of the night, did not add to our comfort.

The only interesting part of my trip on the banks of the Buller is from the Rotiti to the Matukituki valley, which I had formerly travelled in the company of Mr. Fox. After leaving the Matukituki, the river is quite worthless, and offers no room for a journal, saving many days' hunger, the danger of crossing its tributary streams, and the apparently interminable labour of making our way through so frightful a country, and in continual heavy rains.

24th.—Bad news; Epika taken ill, and not able to move about. A very heavy shower about midday.

25th.—I had again the pleasure of proceeding onward, and came to an overhanging rock, which offered shelter against the rain which was falling in torrents. We had curious lodging here, each one having to look for his own. As it happened, we all managed to find a shelter of some sort. Mine was under and between some granite rocks, and my bed-place fitted me something similar to a badly-made coffin, but harder and colder.

29th.—Hunger, bad lodging, and want of firewood, drove us onward about a mile through a heavy rain. We erected a nominal shelter with my blanket near a large pile of driftwood, by igniting which we managed partly to re-dry our clothes, also to allay our hunger.

30th.—To-day, instead of coming down in drops, the rain fell in a regular sheet of water. All hands busily employed in keeping in a spark of fire. Everything about us soaking wet. Finished my stock of sugar and tea, and I felt I was fast losing all my English diet.

April 1st.—Fine day over head, but the bush too wet, and the river too much swollen, to admit of onward progress.

2nd.—At last we were all on our way again, with a fine day, and what is better, all the natives convalescent, except from hunger. Having to commence our day's walk on a 24 hours' fast, we accomplished a moderate distance, and camped where the natives reported a good eel-ground. Shot a wihu, or blue duck, which, being divided among five of us, served for a meal until morning.

3rd.—Another fine day induced us to proceed, having eaten an eel breakfast, and feeling the benefit of it. Stopped by a precipice, which wanted exploring previous to venturing over it. It tries one's nerves to be dangling on a flax-rope about 100 feet above a granite rock, with the load on the feet and no hold for the hands. So it was with us, for we had at least 100 feet perpendicular to descend, and, what was worse, the rock projecting at the top. Again caught eels.

4th.—Ekehu explored our way, and returned with six wekas; but bad accounts of the road. Fine day.

5th.—A drizzling rainy day; but Ekehu told us to pack up and follow him, for after rain the road would be impassable; so we started, and found the road

truly dangerous, although Ekehu had rendered it passable by means of flax-ropes. Built a house, but found it little wanted, the weather clearing up.

6th.—A full meal and a peep of the sun made us saucy enough to leave our comfortable lodgings and proceed. About midday it began to pour down again, but after some time we found shelter in a hollow rock, which would have been 1st rate, but we were in constant tribulation from the continual falling of stones from the roof of our cave. The appearance of the country was much altered, the hills lower, the formation a kind of soapstone, and the forest, pine-trees and their concomitants.

7th.—Weather appearing better, Ekehu was off trying all parts of the river to enable him to reach the other side, he having heard the cry of the weka during the night. He at last succeeded, and returned with a dozen wekas, and some sowthistles. A rich supper followed, and I once more enjoyed a full meal.

8th.—A fine day, and again on our legs: we made our best day's walking since leaving the Matukituki valley. Towards eve, looking down a beautiful reach of the river about 3 miles long, we espied the mountain range that bounds the West Coast. It appeared some 20 miles to the range.

9th.—Another fine day brought us on about 14 mile, when the cry of the weka caused my two male guides, or rather travelling companions, to drop their loads and hurry in search of them. They returned in the evening with ten wekas, six kakas, three teal, and fourteen crows or kakapas. I considered we had then enough to enable us to have two meals a day. Birds, eaten by themselves, much disorder the stomach. There is much harmony in the cry of the crow in its wild state, I think more than in that of any other bird in New Zealand. By imitating its cry it is easily caught by a flax-snare. They make the next best bait for eels to worms. They are very hard and poor, except in the months of April and June, when they get fat.

10th.—We again progressed about 2 miles, when we camped on account of the rain. Chose a curious lodging under an overhanging rock, just enough to cover us, all lying in a row head to feet. We looked strange enough, each having a division caused by our kits, and three fires burning outside. Entered upon a fine tract of wooded land, on either side of the river. We must have passed at least 20,000 acres of good level land this week. On questioning the natives of Kawatiri, I found this to be the valley Inakaiona, or Oweka, and that they formerly had a cabbage-garden here, to which they resorted for bird-catching, and that had we known, we should have found plenty of vegetables had we crossed the river, and also an old canoe. They told me that this valley was their route from the Roturoa to the Mawera, as also to Port Cooper, in former times, before they were conquered by Enihu. I met with an old man called Waiwai, who had once been the journey to the Roturoa. It is evidently a large valley, no hills being visible looking S. Again successful in the game line, securing four pigeons and eight wekas. Such are the bush feasts and fasts.

11th.—Necessity compelled me to abandon my old trousers, and put on my second pair, and also a new shirt. Showery all day.

12th.—A fine day induced us to proceed, and we came to the mouth of a good-sized stream on the S. bank, flowing from the southward down a large valley. The wood in it consisted of the pine tribe and its appendages, but it had also patches of fern and grass.

13th.—Still staying at the same place, for what reason I know not, unless to allow Ekehu to kill a dozen or two more wekas.

14th.—Travelling down the bank of the river, with level bush land on either side of very fine quality.

15th.—Still walking on fine rich level land, all wooded. Camped on the banks of a river flowing from the northward. We can from here distinguish the chain of mountains that bounds the coast.

16th.—One of the women taking a fancy to a small patch of fern growing

here, and a large boil on Ekehu's knee, formed a sufficient excuse for remaining here another day. I amused myself by walking about, but the country being all wooded I could see nothing. Epike supplying vegetables. A fine day, but very cold.

17th.—The fern-root not being good, and Epike not finding us a breakfast, we started. I had the pleasure of passing over at least 2 miles of this long and crooked river. The country still good.

18th.—Nothing doing but bird-catching. We succeeded in obtaining about seventeen wekas, a dozen pigeons, a kaka, and six crows, on which the natives made a full meal.

19th.—Again on our journey, the country still level and timbered with pines. Came upon an eel station, where Ekehu caught twelve eels, a sole, and a large trout, the largest I had seen in New Zealand—I should say it weighed at least 2 lbs. There is a particular tapu existing amongst the natives relative to the eel. You must wash your hands before going to catch them, and also on returning, and the bait must be prepared some distance from the house. There must be a distinct fire for cooking the eels, for which you must have a special tinder-box; your hands and mouth must be washed both before and after partaking of them, and should it be necessary to drink from the same stream from which the eels are caught, you must have two vessels of water, the one to drink from, the other to dip from the stream. Whether this relates to particular places or not, I am not able to say, but I found it strictly adhered to at Okitika and Okaritu. At the former place I had to walk half a mile for water, with a stream running within a few yards of our station. The heavy fogs that fall here during the night render it impossible to start much before midday, unless you choose to get wet through.

20th.—Another day's progress, but a short one, as we had left the level country, and were again amongst our rocks and mountains. Built a house, which was very much needed, having a very wet night. Again caught eels.

23rd.—A fine morning, with a prospect of being able to proceed towards midday when the bush would be a little drier. Made a start, and came on a fair day's walk, but still between the ridges of precipitous hills.

24th.—A very short day's journey, the natives fancying they had found a good eel station, but for once they were deceived, catching only one small eel.

25th.—Want of firewood compelled us to shift our quarters a short distance; the wind shifted to a rainy quarter.

26th.—By some caprice the natives, after losing all the morning, made a start just as the rain began to fall, and we came on a short distance, accompanied by heavy rain. Took up our quarters under an immense rock nearly 100 feet high, which, having a slight projection, afforded us some shelter. Very poor quarters—no firewood; the continual drip, and the trickling of a small stream from the rock, saturated our bed clothes long before morning.

29th.—Hunger drove us from our quarters. Although only showery, yet the drip from the bush made us all wet through in a short time. Completed a fair day's walking, particularly so considering it was performed in the morning before a breakfast of fern-tree; but Ekehu, with his usual energy, secured us a supper of wekas.

30th.—Came on another day's walking, and were still jammed in between two high ridges of black birch hills coming almost perpendicularly down to the river's edge.

May 1st.—An awful day's journey. The hills coming down to the river's edge, with perpendicular precipices at their base, yet we were compelled to ascend them; but by night we managed to reach a shingle beach on the river-bank.

6th.—Raining and blowing a tempest just after dusk. The fresh in the river came down a torrent, driving us out of our shelter into the rain and wind to pass the night how we could. We, however, managed to throw our blanket

over a pole, and there remain without fire until the daylight assisted us in improving our habitation. When shifting, the fresh came down so rapidly, that many of our things were left to the mercy of the river, my gun and boots amongst them. The gun was recovered when the fresh abated, having lodged in an overhanging bush, but all our salt was destroyed.

7th.—Found on inspection this morning about 5 feet of water running over our previous dwelling. Formed our blanket into a tent, and spent the day in making a fire. Towards evening the rain ceased, and we had a fine night.

8th.—A fine day, but no prospect of moving for some days, the fresh having rendered our progress impossible, and the hill in front too perpendicular to ascend.

9th.—Moderately fine. The natives went eel-fishing in the evening, and returned with enough for two meals, and with a promise that with a fine morning they would try to make some onward progress.

10th.—Alas! this morning, instead of proving fine, was the commencement of a violent tempest, and the rain poured down in torrents all day.

11th.—About two o'clock this morning the river again rose most rapidly; and about four o'clock it found its way over its banks, and into our tent. We were again obliged to brave the storm, and, shouldering our loads, and throwing our blankets over our shoulders, perch ourselves on a tree, and await daylight, when we found means to ascend a few feet higher, and build a new house, but we had no firewood.

14th.—The wind had changed into a better quarter, and we had a drier day, but we could find no provisions, and had only 4 oz. per day. The natives when very hungry wanted to kill my dog Rover, but I refused, stating, as my reason, that I wished to keep the dog for our last resource. The Lakote, a very indifferent species of fern-tree, was found here, but we had not the proper means of cooking it. It requires the application of great heat, and must be allowed to remain in the oven at the least 12 hours, when it will be found a palatable but far from satisfying dish.

15th.—Moderately fine: and we were resolved, should the morrow prove as fine, to break through our rule of holding the Sabbath, and proceed somewhere in search of food.

Sunday, 16th.—You must never calculate a day ahead of you on this river. After a fine night we had to-day a thorough wet day.

19th.—Although the day appeared far from fine, yet we mounted our loads on our half-starved backs, and managed to proceed a short distance, hoping to push past our precipice, before which we had then been detained 10 days, all but starved; but the rain again caught us, and we passed a most miserable night. Heavy rain, accompanied with thunder. We killed a robin, which served as the bait for an eel, which Ekehu caught, and gave us for supper.

20th.—Another deluge of rain compelled us to erect a shelter, although half famished, and await the conclusion of these gales.

22nd.—A bitterly cold day. We, however, managed to accomplish a short day's walk, at last surmounting the precipice which had so long detained us, and slept without shelter: the rain, however, gave us a wetting during the night.

23rd.—Hunger again compelled us to shift our quarters in search of food, but finding none, I was compelled, though very reluctantly, to give my consent to killing my dog Rover. The flesh of a dog is very palatable, tasting something between mutton and pork. It is too richly flavoured to eat by itself.

24th.—Last night we were again visited with a deluge of rain, which completely covered the surface of the earth, so that we had to sit all night ankle deep in water. With the daylight, we all set to work to erect a shelter, which we sadly wanted. We could find no thatch, so we made a roof of small straight birch poles. The soles of my first pair of boots forsook me, and I had to take a new pair.

27th.—A slight improvement in the weather, but our dog nearly consumed, and we could find no other eatable: the weather too cold for eels, and birds are not seen in the black birch woods.

28th.—A bitterly cold day, but dry, so that we were enabled to proceed on our journey. Although the character of the country had now changed, and we were passing through a level country, having with our last precipice taken leave at last of the fearful rocks and mountains among which we had been wandering for nearly five months, and had reason to think we could not be very far from the sea-coast, our condition was far from being a pleasant one. We were still on the brink of starvation in an enormous and dense forest, too thick in places to see our way, from the quantity of supplejack, briar, ekiakia, with deep moss, rotten timber, and pools of water covering the surface of the ground, and no means of judging how far it might still be found to extend. We camped in the bush, and I passed one of the coldest nights I ever recollect: I was one complete shiver all night, perhaps as much from hunger as from cold. No rain for a wonder.

29th.—Travelling still the same. Camped on a small reach of shingle. Another cold night, but I managed to obtain a little sleep during the night, being very tired: had a pigeon for supper. Found a mamakou, which we cut down, and intended baking on the morrow.

The natives bear hunger badly. They get irritable in temper, and lazy. I had much trouble with all but my own native Ekehu, the rest continually asking in what way I could compensate them for their sufferings: they were also constantly lamenting their coming into the bush.

31st.—A dirty cold day. The natives searching for food found a recently-made Maori oven and a wari. I also distinctly heard the roar of the tide, which was to me as good as a dinner. A showery night; built a shelter.

June 1st.—Proceeded a short distance, when the rain compelled us to build another shelter. The tide more distinctly to be heard.

2nd.—Proceeded a short distance, and camped under the shelter of a large rata; the bush one complete mass of briar, supplejack, and ekiakia, with immense rata trees.

3rd.—Had the satisfaction of seeing the tide rise in the river. The travelling still very bad, but hunger and the prospect of relief before us made us get through a fair day's journey.

4th.—During the night the rats stole the provisions designed for our breakfast, so we had to start without one. Accomplished about a mile, when we saw the pa of the Maories. Fired a salute of powder, but received no answer, neither could we discern any smoke; so we pushed on, and by night reached our old quarters, where I once before had slept on my trip with Mr. Heaphy down the coast.

5th.—To be disappointed after three months' anxious anticipation is truly vexatious, but such was the case with us, for, on exploring this morning, we found two canoes, a wari, and a wata, but no provisions—so, after many days and nights looking forward to a full meal of potatoes, on reaching the coast we were compelled to eat the rimu, or seaweed, instead. Yesterday I should have thought seaweed poisonous, or nearly so; now I eat it with a relish. So much for hunger. A dirty wet day, with thunder at night.

I was much disappointed in the last 8 or 10 miles of this river. I had previously seen the land from the coast, and thought it good and richly wooded, where, on inspection, I found a wet mossy surface, with little, if any, vegetable soil, the growth being chiefly rata. It will certainly not be in my time that the banks of the Kawatiri will be cultivated by a white population.

From the windings of this river, and its steep granite rocks, and also from its being all thickly wooded, I found it impossible to take any bearing of its course. I could distinguish by the sun its numerous windings. In some of them I found it run due E., sometimes N., and principally to the S.W. or W.

In my opinion, the whole northern bank of the river, down which I travelled, is perfectly valueless, being mostly black birch, and very steep. There appear no indications of coal, slate, or any metals, the chief formation of the country being coarse granite rock. The opposite bank seemed to contain pine-trees in many places, and to have large flats of level timbered land; but the valley *Hakaiona* is the only open country of any extent on the banks of the Kawatiri, from the *Matukituki* to its embouchure.

6th.—This morning we saw a native on the other side of the river, who told us the Maories were at *Omau* collecting mussels, but would return in the evening. We launched a canoe and crossed the river, but found nothing eatable there, and but a small potato-garden. This is the first year the natives have resided here, and to form a cultivation they had carried their seed potatoes from *Mawera*, a distance of nearly 60 miles, over a most difficult country. Returned to our shed in the evening.

I think, from the number of seals I saw on the Black Reef and on the rocks off *Tauranga*, it would pay a party of industrious men to go down there sealing. The last party were too lazy, and not properly outfitted. The natives tell me the seals had deserted this part for some years, but were now returning in great quantities.

At *Tauranga*, some years ago, a crew from a sealing-vessel landed and killed five natives, in revenge for some of their crew having been killed by *Enihu* for the crime of stealing his daughter.

Last year a party of natives, residents of *Mawera*, walked to *Kawatiri* to see the sealing party and boat, and established small potato-gardens at *Tauranga*, *Totara*, and *Potikohua*. This will render the walk from the *Kawatiri* to *Mawera* easy to accomplish. We also found the ladders to the *miko* cliff much improved, and several other alterations, showing the traffic that had taken place. *Mouwika* had made five journeys to remove his effects and supply seed potatoes.

The coast from *Wanganui*, the residence of *Enihu*, to the river *Kawatiri*, is called by the natives *Taitapu*, and is allowed by them to belong to *Enihu* by conquest. From thence southward is called *Potuni*, and is said to belong to *Tairoa*, the present chief of the *Ngatan* tribe.

From the *Kawatiri* to the *Arahura* I had previously seen, and the character and features of the country were fully described by Mr. Heaphy on our return; I have therefore nothing to notice except a few personal incidents, the relation of which would interest no one.

Since my last visit to *Taramakan*, the natives had increased their wealth by the addition of three pigs—a boar and two sows. They were given them by the natives of *Massacre Bay*, and were carried down here during the summer. The sows had each a litter of pigs some few days old: the one two, the other seven young ones. Pigs being new to them, they were kept in the chief's house, to which I, being a stranger, was forced to resort; and they certainly did not add to the comfort of visitors, for I had to keep up a continual fight with them at night for the possession of my blanket, and during the day for my kit of potatoes. Pigs may tend to increase the wealth of the natives, or assist to flavour their potatoes, but they certainly do not tend to increase cleanliness or promote industry. I am sure nothing could be so useful to these natives as goats, for which their country is well calculated. Goats would be more useful, and less troublesome in their potato-gardens. The skins would serve them instead of dog-skins, of which they are very fond; and it would induce them to lessen the number of their dogs, the whole of the island being now overrun with them, as they never kill a dog unless for its skin. I took much trouble to impress the value of goats on them, and promised them some if they would come and fetch them from *Nelson*, which they engaged to do.

7th.—This morning we crossed the river in a canoe, and were received with a hearty welcome by the natives. There are only three men with their wives,

and five boys, living here: they had eaten all their potatoes, and were living on mussels and fern-root. The native Owika told us he was ashamed of the diet he had to offer us, but that the sealing-boat had been there, and the party had consumed all his potatoes and fish. This being the first year of occupying Kawatiri, he had to carry his seed potatoes from the Mawera. The natives are members of the Wesleyan church. A dirty wet day.

9th.—My natives turned out to procure fern-root, hoping to find better than the natives gave us. They could find none, and returned empty-handed in the evening.

10th.—Staying with the natives, and sharing their food. Found some sow-thistles to improve our diet.

11th.—The natives collected and cooked an oven of the fern-tree. A showery day.

12th.—Shot a dozen pigeons, which we divided amongst the natives.

15th.—This morning at daybreak we were on our way to Arahura, having in company Topere and son, and a lad named Henry: they are going to Taramakau for seed potatoes. We reached Kamakawa, and put up for the night, which proved a very rainy one.

16th.—A rainy day, but we came on to Tauranga in search of food, it being a celebrated place for mussels. Saw several small seals playing about on the rocks. The natives have made a potato-garden here on the promise of the sealers to return with a larger vessel next summer.

18th.—Made another humu of mussels, so that we are now prepared for crossing the Tuhinu range when the weather permits—thus escaping 14 or 15 miles of very difficult beach travelling, known in Cook's chart as the Five Fingers.

19th.—Came to Topara, collecting a small quantity of fern-root at Okari on our way. A wet drizzling day, with heavy rain at night.

20th.—A fine day, and we are enabled to reach the Ngawaitakere, and get all ready to cross the Tuhinu range.

Sunday, 21st.—This morning I was astonished by seeing the natives making preparations to start. However, such was the case; and they told me, when I remonstrated with them, that they had the authority of the Church allowing them to travel on a Sunday when away from their pas. So we ascended, and slept on the summit of the Tihuni range. Rain.

22nd.—Reached Potikahua, and made some preparations for cooking the mamaku.

24th.—Came on to the ana Matuku.

25th.—Came on to the Rotuku.

26th.—Reached the Miko, when the natives went out on the cliffs snaring the koukou, and returned with seventy-one of these birds.

27th.—Crossed the Miko range, and reached the Punahaere, where we slept. Some rain.

28th.—Came on to the Waimangati, to be in readiness to reach the pa in the morning.

29th.—Came on to the pa Kararoa, and once again in my life enjoyed a hearty meal of potatoes. Found only four natives and two children residing here; the others had left to join the natives of Massacre Bay, now the wars are over.

30th.—Staid at the pa resting ourselves. For what reason the natives choose to live here I cannot imagine. It is a place devoid of all value or interest. They have but little ground to cultivate, and they catch no fish, the only acceptable food being the mussels, which they find on the rocks on a calm day at low water. There is not even the ponamu to be found here as an inducement.

July 1st.—Made an early start for Mawera this morning, which we reached about midday, and found the chief Te Uru there with a lot of natives. Te Uru is the father of Tairoa, and the acknowledged head of the Ngatau tribe. Had

a long cry, with much rubbing of noses, which ended in a feast of potatoes. I found some fresh arrivals of natives here since my last visit, who had walked over from the E. coast.

7th.—A fine day, but very cold. All the surrounding country covered with snow.

9th.—Started with a large number of natives, twenty-eight in all, for Taramakau, which we reached in the evening, and were received with the hearty welcome usually given to strangers.

10th.—At Taramakau, feasting on potatoes. From Taramakau, on a clear day, seen bearing S.E., is a lofty-capped mountain, which is considerably higher than the mean range of which it forms part. This peak is called by the natives Kai Mataiu, and is seen from the eastern coast, at Port Cooper. The river Taramakau, and also the branch of the river Mawera called Potikabauhau, take their rise from this mountain.

Sunday, 12th.—Attended native service and school in the evening. The natives here are members of the Church of England, and attend service regularly; but they appear to me very ignorant of its nature or meaning.

13th.—I wished the Maories to proceed with me to the southward, but they refused, and those living here told me I could not go during the winter: so I found myself fixed here for an indefinite length of time.

My journal during the three ensuing months contains little except a record of the weather, and of little excursions I took to acquire a better knowledge of the country, and of native habits and customs. I therefore omit it, excepting a few unconnected remarks I pencilled down from time to time.

Paroa was the only place where I found a native avaricious. I moved into a new house there from the pigs and fleas, when E. Toto wanted payment for the house and potatoes he gave me. I therefore left him, when he was taken to task by the other natives.

There are two men, four women, and three children, living at the mouth of the river Mawera, on the northern bank; and two men, two women, and seven children on the southern bank. They are all members of the Wesleyan Church but two, who are of the Church of England.

The natives here preserve the birds they catch during the winter months, when they are in excellent condition, in a rimu or sea-weed bag. They open the bird down the back, and take out all the bones; they then lay the flesh of the bird in a shallow platter made of the bark of the totara-tree, which is called a patua, when they cook the bird by applying red-hot stones; they then place the cooked birds in the rimu bag, and pour over them the extracted fat, and tie tightly the mouth of the bag. I have tasted birds kept two years in this manner, and found them very good. They also keep eels and seals in the same way, using whale-oil for their preservation.

This district used to be noted for its numerous birds—wekas, kakapos, and kiwis—but they are now almost extirpated by the wild dogs.

The seasons are earlier than in Blind Bay, although a degree more S. This is shown by the vegetation. The natives also plant their gardens much sooner. They tell me they have no crop if they plant in December, which is the month usually chosen by the natives in Cook's Straits. Potato-planting is a regular feast among the natives here, and all the good things are reserved for and produced on this occasion, the chiefs trying to outdo each other in liberality and profusion. In the present instance, two large ovens of potatoes and fish were cooked and consumed, also a poha of ready-dressed wekas; and, in the evening, a stick of tobacco and a basket of cooked potatoes were given to each workman. There is great taste shown by the natives in the poha, or bag of preserved wekas; and I believe it is always made for a present, for which they expect a return. They very neatly tie the leaves of the raupo, or balrush, round the poha. It is then placed on a three-legged stool, and mounted with a well and handsomely woven crown, made of feathers of the

birds-enclosed. The one I saw contained one hundred birds, and was given by Tipia to Ewi, being a present in return for one of moka, or dog-fish. Tipia and party, on presenting the poha, were also fed, or rather gorged, each having a kit of potatoes and taro, a large quantity of the kotiro, or preserved potato, and garnished well with different sorts of fish. The natives appear particularly fond of giving and receiving presents, and I think the first donor gets off the best.

Potato-planting requires great labour here. The natives having no axes for felling trees, are obliged to ascend all the trees and cut off the boughs, and as the timber will not burn, all has to be carried from the ground. There is no supplejack, but there are some very large rata-trees, which are worse. The axe I carried was constantly in use, and tended materially to increase their clearings.

In most of the charts of New Zealand, there is laid down, about the middle of this island, a large lake, called Lake Kora. No such lake exists, but there is a large mud-flat, or salt-water lake, on the E. coast, near to Port Cooper, and bounding one side of the sheep-run of the Messrs. Deans. Poturingamotu, which is called by the natives Wiora, and, having the same pronunciation, I imagine to be the same lake improperly placed.

There are only seven natives living at Paroa—a man, a woman, and five children, of the Wesleyan Church.

There are twenty-four natives at Taramakan—men, women, and children. Twenty of these are members of the Church, and four of the Wesleyan connexion.

There are only three natives living at Arahura—a man, wife, and one daughter. They are members of the Church.

There are four natives living at Okitika—one man, two women, and one child—members of the Church.

The natives tell me there is a lake and a grass plain of some size on the banks of this river, but I am too anxious to proceed to visit them.

In October and November commences the fishing season here—the mutta, or white-bait, entering the rivers with the tide in great quantities. They are in such shoals that I have seen the dogs standing on the banks and lapping them from the stream. The natives take large numbers, which they lay on flax mats, and expose to the sun three or four days; they then pack them tightly, and preserve them in their storehouses for winter use.

October 12th.—With a right good will I mounted my load on my back, and after many shakes of the hand, and much rubbing of noses, I left the Taramakan natives, and for once more felt myself moving with my own inclination. I had the company of the three chiefs at this place, viz., Te Kau-hauke, Tipiha, and Paeture, with his daughter (leaving my own party behind), just in my opinion a nice little party. We reached Arahura, and put up for the night, which proved a rainy one.

15th.—Fine. Started for Okitika, a river of some considerable size, at the mouth of which was formerly a large pa, occupied by Enihu, and the other natives now living at Wanganui. There is an old canoe here, which the natives told me was once used for hapuka fishing in fine weather, but that the sea has encroached on the land and rendered the bar dangerous. There is some good bush land on the banks of this river, and some tara plantations of former days. Walked out 6 miles.

16th.—Launched the canoe and crossed to the other bank, where we had to erect a shelter against the wind and rain.

19th.—Fine. Soon after daylight we shouldered our respective burdens, and made a good start, reaching a stream of water called Paiere, which runs parallel to the shore for 5 or 6 miles. We took breakfast at a small potato garden here, and again moved on to a small stream called Totara, which is narrow and fordable, but runs very strong. We took a small repast here and waited

for the tide. When we could proceed we walked to another stream called *Mikonui*, which we reached by dark, and also stopped here some time for the tide; but we crossed at last, having to swim over twice to carry our clothes. The whole distance, about 16 miles, is a dense mass of wood—on the hills chiefly rata, and pine on the flat. The travelling for the greater part is on a loose shifting sand. Bearing of the coast about S.W.

20th.—Started with the rising sun, and after proceeding about 2 miles, came to a curious headland or cliff, named by the natives *Paramata*, which projects some way into the sea, and, from its position and appearance, must be a bold head. I could take no latitudes, my sextant having been spoilt by the wet. Here I found a stratum of very fine slate on a bed of inferior coal, under a kind of blue clay. The slate is hard, of a fine grain, splits freely, and is of a reddish brown colour, resembling Welsh slate. About 6 miles further we came to a good sized stream, named *Waita*, about half-a-mile across, which we forded chin deep. There is but little land on the banks of this river available for cultivation before you come to the minor hills, from which rise the mountains that bound the W. coast. We made a long march, and a little after sunset came to the mouth of another large stream called *Wanganui*, when we camped for the night at a native pa, but the inhabitants were absent; we found some potatoes however for our supper. From *Waita* to this place the beach is chiefly composed of sand and rocks alternately, and the coast mostly bounded by cliffs. The *Wanganui* is a pretty river, but with little level land, and all wooded. It was here *George Darowell* and party beached their boat. There is also a peculiar headland on this river, sketches of which I made. Fine.

21st.—About midday, when the tide permitted, we crossed this river, and reached another called *Poeru*, which is a strong running stream, about 150 yards wide. It is much noted for a pond on its banks abounding in eels of a fine quality, which is a summer residence of the natives. The coast for about 6 miles is still bounded by a range of cliffs, and is in all directions a dense mass of forest, chiefly rata on the hills and on the banks of the streams, either large or small; the pine tribe predominates. The route from *Taramakau* is across a series of small sandy bays, with rocky points dividing them. The bearing of the coast, S.S.W. by compass. Rain towards evening.

I believe I have now acquired the two greatest requisites for bushmen in New Zealand, viz., the capability of walking barefoot, and the proper method of cooking and eating fern-root. I had often looked forward with dread to the time when my shoes would be worn out, often fearing I should be left a barefooted cripple in some desolate black-birch forest, or on this deserted coast; but now I can trudge along merrily barefoot, or with a pair of native sandals, called by the natives *pairairai*, made of the leaves of the flax, or, what is more durable, the leaves of the ti or flax-tree. I can make a sure footing in crossing rivers and ascending or descending precipices; in fact I feel I am just beginning to make exploring easy work. A good pair of sandals will last about two days' hard work, and they take only about twenty minutes to make.

22nd.—Made an early start this morning, and after travelling along a rocky beach about 4 miles, came to a mountain torrent falling over a large bed of granite rocks. It is called *Wairoa*, and is a very ugly stream to ford. The natives told me four young men were lately drowned in crossing it. We all got safely over, and walked to *Okaritu*, passing another stream, named *Waitaki*, on our road. We found some natives here. It is about 10 miles from *Wairoa* or *Okaritu*, but there is no level land, the snow-capped range coming down to the coast.

At *Wairoa* is the wreck of a large sealing boat amongst a lot of underbrush. It is about a quarter of a mile from high water, and the growth of the bushes and the appearance of the wreck show that the sea is fast receding from this coast. This also appears at the mouths of all the rivers.

1. *Okaritu* is the pa where *Enihu* captured and killed many of the natives of

the Ngaitau tribe, and also took Tu Uru, the chief, prisoner, whom he has since released to return here and work greenstone for him. There are the remains of a very large pa here, which was resorted to for fishing and bird catching. That these places abound in eels I had full proof during my visit here, the diet being nothing else, and was served out in liberal quantities, to dogs as well as Christians, three times a day.

There are six natives living here—two men and four women, who are of the Wesleyan church, and very punctual, and apparently very zealous in their worship. This pa should be celebrated for the number of dogs kept by the natives, and all in good condition.

23rd.—Staying at Okaritu, the wind coming from the N.E., and bringing its usual companion, heavy rain. Okaritu is a large mud-flat of at least 10,000 acres in extent, but nearly all covered at high-water, and is only remarkable for its quantity of fish. The timber here is very small, and appears of recent growth. I think to the foot of the mountain range has been recently washed by the ocean. At high-water, and at this season, when the rata is beginning to bloom, this is one of the most beautiful pieces of scenery I have seen in New Zealand. It is a great resort for all kinds of water-fowl, and the Paradise ducks come here from all quarters in the moulting season. Commenced wearing my third new shirt. My wardrobe now sadly diminished in bulk.

28th.—About midday, at low-water, we constructed a raft of the blossom stalks of the flax, and crossed the river, when we walked about 4 miles to a small stream called Totara, having very pretty scenery, but otherwise of no value. From Okaritu the route is along a range of low cliffs with a sandy and rocky beach, only passable at low-water. We stopped here for the night, the tide preventing our onward progress.

29th.—After proceeding about 2 miles we reached another stream also named Totara, and much like its namesake. We were obliged to erect a shelter at this place against a regular tempest of wind and rain.

31st.—Showery. The natives proposed leaving our loads here and returning to Okaritu to attend service on Sunday. To this I gave consent, knowing that I should get a good dinner of eels and more comfortable lodging.

I am much astonished to find amongst the natives in these distant parts so much attention paid to their forms of religion, which is the Church and Wesleyan. Much animosity appears to exist between them: and although in some places there are only six or seven natives, yet they have separate places of worship, two schools, and are always quarrelling about religion, each party asserting its own to be the proper service to God. There are some few who have been christened by the late Rev. C. L. Reny, and a few also by Mr. Aldred, the Wesleyan missionary.

3rd.—Made another start and reached our shed and burdens again.

4th.—Proceeded about 4 miles along a rocky and shingly beach, and came to a large mountain rapid running over a large granite bed. The place is called Waihaa, and I found it so flooded as to defy my crossing, and there being no means of ascending, or any shelter to await its falling, I was obliged, though very reluctantly, to return to our shed at Totara.

7th.—Made a resolute start to cross, if possible, over the Waihaa, which, with great difficulty and at the risk of our lives, we accomplished. It was at this place that the wekas had been caught I had feasted on at Taramakau: they resort here, dogs being unable to cross the river after them. Slept at a native wari here. Fine.

9th.—Again making southing, and reached a stream called Waikukupa, deep and not fordable, but of no other note. Passed on to another stream called Miroroa, where we camped for the night, having spent much of the day constructing a raft to cross the Waikukupa. About 8 miles of travelling over sand and rocks.

10th.—Proceeded onwards, and rounded a headland named Kobaibai, a low

rocky point; and managed, after difficult walking, to reach a river called Waiweka, where we constructed a raft ready for crossing in the morning.

11th.—Crossed the river, which is a very dangerous stream flowing from the mountains over a rocky bed, and proceeded to another small stream, which we crossed, when the rain compelled us to erect a shelter.

13th.—The weather permitting us to proceed, we came along the base of a low range of cliffs called the Parapara, and on to the Utumou, a small headland, the terminus of the cliffs, when a short sandy beach brought us to the mouth of a small stream called Matukituki, where we stopped for the night. From Kohaihai headland to this point is about 16 miles. Bearing S.W.

14th.—After proceeding about 3 miles along a rocky beach we came to a small point called Makawihio, on rounding which we crossed the Waitaki, a mountain stream, and proceeded onwards to a small potato garden at Porangirangi, where we put up for the night and the morrow. Distance about 9 miles.

16th.—Proceeded about 6 miles, and arrived at Parika, the residence of Tuarohe. We passed a small stream called Hunuakura, of no note or value. At Parika we received the welcome of strangers in a bountiful supply of fern-root, preserved wekas, and fish. There is nothing remarkable here, it being only a summer residence on account of the eels in the river.

The natives attach a great value to their greenstone meris, or battle-axes of former times, so much so, that they are buried with their owners. After remaining in the ground some five or six years they are dug up, and given to the nearest relation of the deceased. The natives have also safe hiding-places for them, in order that, if surprised and conquered, as in former times, their enemies might not find them among their spoil. I saw one belonging to Te Raipo, which has descended from time unknown, and which they say Enihu made war on their tribe to obtain, but could not find it, the meri being hidden at the bottom of a deep pool of water.

There are only 97 natives, adults and children, living on the W. coast N. of lat. 44°, all of whom profess some form of Christianity: 29 of them are members of the Church, and 68 Wesleyans.

18th.—A shower of rain formed, in our united opinions, a sufficient excuse for remaining here another day. We managed to dry enough eels to last a week. There are no provisions to be found here saving the kakote.

19th.—After travelling about 3 miles we came to a headland called Titihiaia, where I slipped, or was rather washed from a rock by the sea, which crushed my foot between the rocks, and severely strained my right ankle. I was also hurt in several places by the sharp edges of the granite, which gave me much pain. Finding I could not clamber the rocks among which I fell, I was obliged to suffer myself to be led towards Parika, which my lameness and the tide prevented us reaching that evening.

20th.—With much pain I crawled to Parika, where I bound up my leg, and repeatedly bathed it in cold water, which served to deaden the pain, and dressed the other scratches with weka oil.

26th.—Paeturi and Tipiha requested leave to return to Taramakau, leaving Te Raipo with me, to which proposition I was compelled to agree.

After another week's rest I thought myself sufficiently recovered to proceed, though my ankle was still far from strong; but ten days followed of almost continual rain. Our provisions were getting short, the country to the southward was of the wildest, most barren and forbidding description, so I at last made up my mind to return, having made my way about 80 miles further along the coast than on my former expedition with Mr. Heaphy.

I was induced to make Parika, or rather Titihara, the terminus of my southward for many reasons. My lameness had made me anxious to return to Nelson, the summer season was fast drawing to a close, and I dreaded the idea of another long winter. The country I was traversing was quite worthless in my

opinion, and most certainly so as respected Nelson. I wished to return by a fresh route, and see something more of the interior of the country, and I had resolved to try the Mawera, if I abandoned the idea of crossing the island from Taramakau to Port Levi. If I had urged the natives to proceed with me to the southward I could not have had their services to assist me with their canoes up the Mawera, and being here without resources I was much at their mercy. Ekehu also had a runaway wife from Wakapuaka, and dared not return coastwards, which would have been our shortest route.

When I told Te Raipo of my intention he was much pleased. He told me that having only one white man on his hands was too great a responsibility: if there had been two, he said, he would not have cared—one might live to tell the fate of the other if an accident happened to him, but if I died it would likely be said that he had killed me for the sake of eating or plundering.

So on Friday, December 11, I turned my face homewards; first to rejoin my own natives, and then endeavour once more to see the face of a white man, and hear my native tongue. A few days brought us back among the natives, although my lameness made walking rather difficult. We passed in succession Okaritu, Wanganui, Waita, Paiere, and Okitika, reaching Arahura on December 22nd. The next day we slept at Taramakau, and arrived at Mawera on Christmas Day. This was well kept by the natives, followers of both the Church and Wesleyan body. There were four services in the day, and feasting filled up the intervals between them.

December is a glorious month of dietary amongst the natives on the coast, as fresh fruit and vegetables are then coming into season. The rivers, large or small, abound in eels, hawera, upukuroro, haparu, patiki, and parauki; the fruit of the ekiakia is then ripe, called by the natives tawara, and is very luscious, more like a conserve than a fruit; the honey of the flax blossom is also in season, called korari, and, when mixed with fern-root, also makes a species of confectionary; the natives also commence on the young potatoes and turnips, and make taro ovens of the mamakou, and of a species of the ti, the stem of which is the eatable part, and is called koari; it is very sweet and pleasant to the taste. This month also the sandflies are most numerous, driving the natives to all sorts of expedients to get rid of them. Fire is the best protection; and you see all the houses with a fire inside and outside, placed so that the smoke protects the entrance or doorway. You partake of your meals under the shelter of the smoke of a circle of fires, the natives objecting to eat in their houses on account of the large meat-fly.

The 15th of December was the anniversary of my leaving Fraser, the last white person I saw on the banks of the Rotuiti river.

Conclusion of the year 1847, the whole of which I have spent among the natives, and chiefly on the banks of the Buller or Kawatiri, during which time I have lived on the produce of the country, and the few potatoes I have had on the coast, which are now, from want of proper cultivation, almost uneatable. I have never heard a word of English the whole year.

While I was at Okitika, one of the native children, the son of Tipia, of about seven years of age, took such a fancy to me that it was with difficulty I could get away from him. When I came away, he clung round my legs, crying, and I was obliged to remove him by force. His father wished me to take him with me, but his mother refused, which I was glad of, as he would have been much in our way in difficulties, and unable to bear the hardships of the bush. At this place, also, an incident occurred by which I gained great repute amongst the natives. A party of us had paddled to Kunsere one morning eel-fishing; and on returning in the evening, at every good situation we took a draught with our kupenga for upukuroro, when at one place the canoe was left with two children in it, who, by playing with the oars, brought the canoe into the current, and as it was making rapid headway for a very awkward shoal, I jumped into another canoe, paddled across the river to the

eddy, and, towing the canoe up the other bank, regained a sufficient length to enable me to recross to our proper station, when a cry amongst the natives at the restoration of their children put an end to a pleasant day's fishing.

On the 24th January I had the opportunity of witnessing the funeral of a woman. Two native carpenters made a strong but rough coffin of totara planks, sawn out of the solid log; and at sunset the body was placed in the coffin, carefully wrapped up in the mat she wore while living. The body was tied down, and carried to the place of burial, where a moderately deep grave had been dug by the young men; a hymn and some prayers were said over it, the coffin was lowered, and the earth filled in. The whole of the funeral was conducted by the men, all of whom, within reach, attended. Everything belonging to the deceased was buried in her grave; and all her stores of food were cooked in a large humu, and distributed to each male adult. There was no crying, and apparently very little mourning, the deceased having no near relatives. I have now witnessed a birth, marriage, and death amongst the natives.

I now made up my mind to go up the Mawera, or River Grey, and visit the lake from which it is said to take its rise. I proposed then to ascertain the nature of the country lying between it and the plains of the E. coast, and to be guided by circumstances as to my future route. Here, however, I was forced to remain stationary for a month. Ekehu had gone fishing with a party to the northward, and did not return for nearly three weeks, whilst the last ten days were fully occupied in making preparations for another start, repairing canoes, and laying in a stock of provisions for the bush. This interval of rest afforded me however the opportunity of making a few observations on the general character of this part of the country. From Cape Farewell, until you arrive at the River Grey, a range of mountains runs parallel to the coast, sending down to the sea spurs or lateral forest ridges, terminating in cliffs and headlands more or less bold and precipitous, the valleys or ravines between each of these contributing a stream more or less considerable, fed by the snows of the central chain and the drainage of its sides. In walking therefore along the coast between these points, you have frequently to clamber over a rocky promontory jutting out into the sea, or, where this is impossible, to take advantage of the receding tide to pass round its base, strewn by the granite fragments which have been detached by the action of the water; and having toiled among the broken rocks for a greater or less number of miles, you again come to another stretch of sandy beach, another river to be forded, and another precipice to try the goodness of your footing and your nerves. The only interruption to this occurs on the banks of the Buller. The mountains here receding from the coast leave a large level tract of forest, through which the river takes its course to the sea, having first broken through the rocky gorge which detained us so long at its base; and then the same description of country recommences until you reach Mawera.

My route down the Buller afforded me an opportunity of seeing the interior of this mountainous region, through the middle of which it seems to have broken its way. My journal sufficiently shows my opinion of the country on its banks. The Inakaiona valley alone seems adapted for the habitation of man; and from the Arahura I saw the opening at its southern extremity, about 50 miles inland, running nearly due S. It may be described as a large tract of level country extending from the Buller to the Mawera, or Grey, 60 miles long by 4 or 5 in breadth, separated from the sea by the mountain ridge of the coast, and hemmed in to the E. by the mountains of the interior; but shortly before you arrive at the Mawera, the character of the country is totally changed. The hills diminish in height, gradually sinking into the open country; and from the Grey you look over a level or gently undulating country, with a coast-line of 40 miles, bounded to the interior only by the line of the horizon. Having passed this tract, you again enter the region of rocks, precipices, torrents, and mountains, or, as I have heard them called, the

Southern Alps of New Zealand. As far as my own experience goes, I should say that it is not impossible to follow the coast down to Dusky Bay, if you can guard against the danger of starvation; but I neither saw nor heard anything to induce me to think it would be attended with any result but the gratification of curiosity. But the district of the Grey requires a further notice. It is watered by four rivers—the Grey, the Taramakau, the Arakura, and the Okitika. The last two, according to the natives, take their rise from a remarkable snow-capped mountain, visible in the far distance on a clear day, called Kaimatau, bearing S.E. from Taramakau; the Grey, said to flow from a large inland lake, and the Taramakau to have its source almost close to it. I now made my arrangements for visiting these localities; and on January 26, 1848, again set out upon my travels.

Jan. 26th.—This morning freighted our canoe with our provisions, clothes, and fishing apparatus. I considered myself as on board the admiral's canoe, which was the largest and first to start, having in company three others. The names of the canoes that ascended the river with me were as follows:—Te Wairakou, with myself and nine natives; Te Maikai, with my four natives and Aperahama; Te Paikau, with two natives, carrying nets, &c., for fishing; Te Muttametta, with four natives. So I think I was well equipped, considering I had nothing to give the natives for all their trouble, except good wishes. There was much crying amongst them when I left, and apparently some good feeling towards me. They told me to return amongst them, and share what they had; and although tobacco is so much valued amongst them, they offered me two sticks—the half of all their stock. It is really an exciting scene to see four canoes poling and paddling up a fine stream on a clear day. We came up about 5 miles of the river, and camped at an old fishing-station, prettily placed on an island called Mautapu, which rises about 100 feet above the level of the river. At this place the river is confined between two low black birch hills, part of the coast range. The level land of the coast reaches to this point, all timbered, chiefly rata, on either side of the river. About a mile above Mautapu is a seam of coal of apparently very fine quality, which presents itself under a stratum of mica slate. The coal is hard and brittle, very bright and sparkling, burns freely, and is free from smell; the seam is some feet deep, and level with the river's edge, but at least 50 feet below the surface of the earth.

27th.—Paddled up the river about 3 or 4 miles, to a point where the river divides itself into two streams—the right-hand and smaller branch, called Kotu-urakaoka, bearing about S.E., and leading to a pass to the E. coast, almost at right angles to the main stream. We stayed here for the night, the natives wishing to fish, and I anxious to look about me. This is the place where Ekehu, my lad, lost his father, and was taken prisoner himself by the Ngaitau tribe. We were successful in fishing.

28th.—Paddled up the S.E. branch of the river, the pass to the E., leaving the women and children behind with two of our canoes. After proceeding about 5 miles, we again left our canoe with some natives to fish, and kept on until late in the evening. This branch of the river is wooded, but with a considerable belt of level land on either hand.

29th.—Again ascended the branch, and by night reached the lake, a sheet of water of about 6 or 7 miles square, with a small low island near the middle, to which we paddled, it being an old fishing-station. Fine.

30th.—Examined the lake in our canoe, and found it very deep, with a sandy or mud bottom, and in some places large granite rocks. The country immediately around the lake is level bush, bounded by a pine forest, and surrounded on three sides by black birch hills of moderate elevation. The country towards the E. is low, but the district is shut in by a high mountain region towards the S.W. This is the lake frequented by the natives on their

route to the E. coast: they reach it from the coast by ascending the Tara-makau, from which it is divided by a long reach. From this point they tell me they reach the open country of the E. coast in two days' walk.

31st.—Returned back to the main stream, where we had left the women and canoes. We had a plentiful supply of fish, showing their industry during our absence.

Feb. 1st.—This morning we again started, leaving our native friends behind us, excepting one as a guide. The fine open land ends here, and long reaches of shingle border each side of the river, which is deep and unfordable. After going up it for 8 or 9 miles, it takes a northward course, nearly parallel to the coast. During the day we passed the mountain at the head of Kararoa, and camped for the night under the range of the Kiwikiwi and Waiwero. Te Raipo, the native whose canoe I am using, ascended all the mountains in search of the kakapo, and seems to know them all well. At each spur he names the part of the coast to which it corresponds. There are houses of former times in many places on the banks of this river, resorted to by the natives for the summer months, when they live on eels, upukuroro, fern-root, and the liquor of the tutu berries. The latter has here a much finer flavour than in most other places, and may be taken freely without injury. We traversed at least 15 miles of the river's bank in the course of the day, three natives working the canoe generally, and all at times assisting, myself chiefly walking on either bank of the river, with the aid of the canoe to cross from time to time. The foliage of the country is chiefly pine, with a belt of manuka on the immediate banks of the river.

2nd.—We ascended about 4 more miles, when we came to a point where the river again divides itself, the smaller branch running to the S.E., the main branch, which is our course, still making to the N. We camped at the junction, to explore ahead previous to taking the canoe. Up to this point the country is chiefly wooded, but at the junction a grass plain commences, which I shall see the extent of as I proceed.

4th.—Another wet day; and my Ngaitau guide told me he must return and see his wife and children, but that if I would wait, he would return with a change of weather.

7th.—A rainy morning, but about mid-day the wind changed, and the clouds began to break, and the night showed signs of a fine morrow. Natives and self off exploring, when we found a patch of fern, which we quickly began rooting up to examine its quality. Finding it to our taste, we resolved to spend the next day in digging fern-root. I took to my fourth pair of trousers, leaving only one good pair in the kit. I find nothing so useful or durable for trousers in the bush as good duck, and nothing worse than fustian.

8th.—Started this morning to our fern-patch, when I left the natives to work, and with some difficulty pushed my way through the lower underbush, and ascended to the grass terrace, which I found running along the river's bank for about 4 miles, and stretching to the S.W. about 5 miles, forming a nice little sheep-run of very excellent grass, and well sheltered, being bounded and intersected by a pine forest containing some good trees. On the northern bank of the river there is nothing but forest reaching to the chain of mountains that bound the coast. On returning in the evening, tested the quality of the fern-root, which was found very sweet and agreeable to the taste, particularly so when mixed with the juice of the tutu.

I had written by a native called Peter, to Mr. Fox, for a small payment for the natives, to enable me to get a guide to cross the island, and also for means to return to Nelson by some vessel, in case I should make any port on the E. coast. Peter promised to return by December, but while I was down the coast he started, and left me a message that he had altered his mind, and would not return until the winter; but that I was to make myself comfortable,

and resort to his potato-garden for provisions. This was my chief reason for returning by the river Grey. My natives also positively refused to accompany me across, saying they should never get back.

While on the coast I caught three kiwis—one large and two small. There are two distinct species. This country used to abound with them, but they are now nearly extinct by the dogs of the bush. They are coarse and ill-flavoured, but make a meal for a bushman.

9th.—This morning we packed up our loads, which, when collected together, were found to be rather bulky: mine however was light, though large, consisting of dried fish. We came on about a mile to our fern-root, where we camped to allow it to dry, and enable the women to enlarge our kits. Fine.

10th.—After accomplishing rather a long mile, we were brought to a standstill by a fall of snow. We erected a shelter at the commencement of another grass-plot of considerable extent, level with the river on the northern bank.

12th.—Came on about 2 miles, when Ekehu, looking back, discovered a smoke which he supposed to be the fire of our Ngaitau friends returning. Self and Ekehu left our loads and returned to ascertain, when we found it was our late house which had taken fire. Proceeded about 5 miles farther, and again built another shed, which the rain at night proved the value of. The banks of the river are a series of grass and fern patches, running back to the main forest some 3 or 4 miles deep, with here and there patches of underbrush.

14th.—After walking about 3 miles we came to a large shingle-bed, where the river divides itself into several branches; and after some exploring about, we took the one to the northward, and ascended about two miles, when the rain began to fall, so we had to erect a shelter at the edge of a grass plain some miles square, apparently very good, and well sheltered by clumps of trees.

16th.—I made a sally out, and found, by ascending a high tree, we had taken the wrong turn, or rather the wrong branch, of the river, its bearing being too much N. I believe this is the pass to the Tuhinu, which the natives formerly travelled to catch seals at Tauranga. When the weather permits, we shall have to retrace our steps to the main river, which must be my course. Rain.

17th.—Another dirty day, at least too wet for leaving our shed to brave the rain, but we managed to procure for supper a fine eel and two woodhens. A sharp frost at night, and very cold.

18th.—A fine morning after the fog had risen, and we once again mounted our respective burdens, and made a start. Leaving the river, we took to a thick though level bush, and steered by compass due S.; and in about 2 miles we came to another moderately large stream, also a branch from the main stream, its junction with which I could see, and which I considered was bearing too much to the S.W. for our purpose: so we took the branch, and ascended nearly three miles, when Ekehu so increased the weight of our loads by the addition of eleven large eels, that we resolved to stop and eat some. The land on either side of the river is level and mostly wooded, the timber being principally of the pine tribe. Fine.

At this point we finally took leave of the main stream of the Grey, which, according to the natives, takes its rise in a large lake to the eastward. Ekehu also recollected having been there when a child. The Grey is certainly a fine river for New Zealand, and worthy the name of our Governor, after whom it is named. Could it be connected with a harbour it would make a fine field for colonization, there being much good land fit for arable purposes, and some good grazing districts in well-sheltered positions; also some very fine timber for sawing, quite accessible, as well as a quantity of fine kauri for spars—at least what I believe to be such. The shingle bed of this river in many places abounds with coal, though of an inferior quality to the seam near the sea. In it is also found the stone used by the natives for rubbing down their poe-namo; it is something like a Newcastle stone, though rather closer in the grain, and has a fine cutting quality.

19th.—We pushed on about 3 miles to the edge of another grass plain, when the rain, which had been falling in showers, began to wet us through, and compelled us to erect another shelter. The quality of the country about the same as usual.

20th.—Very warm day.

21st.—Walked along the grass for about 4 miles, till we came to a division of the river, when I resolved to look ahead before I carried my load, so I went on, and ascending a small fern elevation in the grass plain, chose the most easterly branch for my course, and returned to my encampment. Fine.

22nd.—After walking about 2 miles along the grass, we came to a part of the river shut in between two low ridges of hills, covered with black birch for nearly 2 miles, when we again came to the open country, consisting of grass, fern, flax, and manuka, reaching ahead as far as the eye could see, and about 3 or 4 miles in depth, when it is bounded by a high range. We again progressed some 3 or 4 miles, keeping the banks of the river, or bed, which is not very deep at this place, and better walking than the grass, and camped on the plain. I lit several fires during the night, which burnt all night, and freed us from the nuisance of the sandfly and musquito, for which this river is famed. Fine.

Some of the bends of this river I passed to-day are as beautiful, in my opinion, as nature can possibly make them. The river is clear and deep, and runs over a bright shingle bed; the undergrowth on the banks is a beautiful mixture of shrubs, and the adjoining bush fine lofty rimu, rata, and black birch, with scattered patches of fern land. I was so pleased with the Grey river that I should not object to visit it again.

There is a great number of wild dogs here, which sadly lessens the quantity of ground birds, for which it was formerly noted.

23rd.—The appearance of the country before us induced us to spend a day here on a small patch of fern, and obtain its roots for future use. Fine.

There is nothing like keeping up the stock of provisions whenever an opportunity offers, although the back has to suffer from the weight; for in this country it is often much easier to exhaust than to replenish.

I am also obliged to keep the natives as well fed as possible, for they are continually murmuring; telling me they are sure, if they continue to follow me, I shall starve them. They several times threatened to return to Massacre Bay, and live with the natives there, rather than take their chance in the bush of safely reaching Nelson.

24th.—We all agreed on the necessity of erecting a shelter against the approach of the storm we saw nearing us, which reached us about midday, and just as we were housing our baggage. Caught some eels.

25th.—Rain, in storms, all day, accompanied with heavy thunder and lightning.

26th.—After we had accomplished about 3 miles, the rain again overtook us, and we were obliged to build another shelter. The grass and open country still continues to bound the northern bank of the river, averaging a depth of nearly 4 miles.

28th.—A walk of 5 miles brought us to the termination of the grass, where the river flows between two black birch banks.

29th.—Last night the natives found a hole of water, from which they caught thirty-five eels of various sizes, but, put together, of such a bulk and weight that they would not hear of moving on, but set to work to take out their bones, and expose them to the sun and smoke to dry. Fine.

If eels are carefully dried and skinned, the head cut off, and opened down the belly, the bone carefully taken out, and the flesh exposed to the smoke to dry, they would last some months, and this is, in my opinion, the best way to eat them. An eel should be about 5 lbs. or 6 lbs. weight, and, if too dry, soaking it in water for a few hours, and then basting it over a slow fire, makes it a very good dish.

March 1st.—This morning, while the natives were packing away their fish and other things, I counted fifty-four eels, each averaging, I should say, 3 lbs. in weight, and making a heavy load for three of us to carry. I was obliged to take the heaviest, to keep good humour amongst them, and to be enabled to laugh at them when they complained of being tired. We proceeded about 4 miles, when Ekehu found a good eel station, and nothing could induce him to pass it. Leaving him to fish, we progressed half a mile farther, and came to an open tract of country, consisting of grass, manuka, toitoi, &c. We walked about 3 miles more, keeping the bed and banks of the river, when a fall of rain gave us the trouble of erecting a temporary shelter.

2nd.—This morning I lighted a fire on the plain, and the wind changing drove it down upon us, which burnt our shelter, but the day proved fine, so we cared not. Walked about a mile to the termination of the grass plain, and again took to the banks and bed of the river, which recommenced its course between the black birch. Proceeded 3 miles farther, and awaited the arrival of Ekehu.

3rd.—Accomplished a distance of about 6 miles, which, from the weight of our loads, and the quantity of dead timber in the river, was a hard day's walk. The valley now is fast narrowing, and I hope another day's march will take us to the foot of the mountain range, for I am anxious to ascend, and see something of my whereabouts.

4th.—This morning it commenced raining, and we all set to work to erect a shelter, when we were compelled to resort to the black-birch bark for a covering. In the middle of the night the wari separated just over my sleeping-quarters, which gave me a most uncomfortable night's lodging. Rain all night.

7th.—The day proved fine enough to induce us to leave our lodgings and proceed. After taking the bed of the river for about 2 miles, we deserted the main stream, and took to a branch bearing E., which we ascended about 1 mile. Here we resolved to abandon the river altogether, and take to the low range that skirted the southern bank, which we ascended, and walked along the ridge about 3 miles, when we discerned a large river, distant about 2 miles. We agreed to make a push, and endeavour to spend the night on its banks, which we reached just at nightfall, when the thunder, that had been following us all day, now overtook us, and we had to erect a shelter by the light of our fire.

On the hills bounding the Grey river I caught four kakapos, or green-ground parrots. They are beautiful birds in plumage; but as they have been fully described by skilful naturalists, I refrain from doing so.

8th.—On looking about this morning, we found this to be the Oweka, a river flowing into the Buller. Spent the day exploring and bird-catching.

The pass from this branch of the Grey to the Oweka is very easy, and has only one ascent, and that not at all difficult; the descent also is very easy; the bush is open, and free of roots, and the inclination very slight. A communication from river to river, even for a cart, might be made by simply clearing away the underbrush.

9th.—Started to cross the valley, taking a course E., and found it to be about 3 miles deep. Came to the rising ground, which we ascended, and slept on the side of the mountain. Fine.

10th.—Reached the summit of the hill this evening, and found it covered with low fern, &c. It commands a fine view of the interior of the island; and I could discern mountains which I had known at the Roturoa, on the river Buller, and on the West Coast. The morning was too foggy to admit of seeing the lowland.

11th.—Being a fine clear day, I could see from this place the large grass plain of Port Cooper, which appears to commence from the high mountains in a series of grass hills. The hill I have ascended is very steep and high, and bad walking owing to the dead timber and loose stones; but the natives tell

me their pass over this range is low and easy, and only takes one day from river to river, that is from the lake to the river Wainakariti, flowing to the East Coast; and that it then takes a week's travelling on the grass plain before reaching the sea-shore. I am told that some natives, four years ago, crossed the island in 17 days.

I much wished to descend to the grass plain, and try and reach the East Coasts, but the natives, one and all, refused, and told me that I had kept them already far too long away from Nelson, and that the payment I had promised them was too little for what they had previously done. Even on a promise of further compensation they still refused; so I was obliged, reluctantly, to abandon my desire, and return to the Nelson.

From this summit elevation I was able to look back upon the route I had been travelling for the last six weeks. I was now standing on the further or eastern extremity of the large opening I had seen from the coast; and which I then thought, and now found to be, the southern extremity of the Inakaiona valley. Looking towards the coast, at my feet was the Inakaiona or Oweka river flowing northward through the valley to the Buller, and appearing to rise a long way to the southward, perhaps in the neighbourhood of the upper lake of the Grey, receiving in its course all the tributary streams on the east, coming from the reverse slopes of the mountain ranges at my back, lying between me and the Roturoa. Across the valley, here about 15 miles wide, I looked upon the mountains of the coast, gradually melting down into the open country at their base, which I had just traversed, and contributing their numerous streams to swell the waters of the Grey, whose branches were only divided from those of the Oweka, flowing in an exactly contrary direction, by one ridge of inconsiderable elevation. To my left, at 40 or 50 miles distance, arose the snowy ranges of the Southern Alps, with the white-capped peak of the Kāfātāu towering conspicuously among them. Filling up the interval, were the low undulating forest-clad hills, in which both the Grey and the Oweka take their rise, whilst behind them stretched the grass plains of the Eastern Coast.

12th.—The natives were not willing to spend the day on the summit of the hill, and refused to follow my course to reach the Matukituki valley, saying, that if I did not return to the river we had left they would, for we should be all starved if we ventured to take a short cut through a black birch country; so I was compelled to descend the hill by nearly the same route I had ascended it. Fine.

I did not want to follow the circuitous course of the river, but to steer a compass course towards the Matukituki valley, or the Roturoa; but the natives told me that the river was the only place where provisions, or rather food, could be obtained, so I had to return to its banks.

13th.—Reached the bank of the river, and camped about a mile below where we first made it. Fine.

14th.—The natives hearing numerous cries of the weka during last night, wished to stop here, to which I assented, having again hurt my weak ankle, which was giving me much pain. The river here is very pretty, flowing between two narrow grassy banks, behind which the wood commences, consisting of stately pines of all kinds—kauri, kaikatea, remu, totara, and the matai, with here and there a large birch, altogether forming a beautiful variety of foliage. During the day the natives caught twenty-seven wekas, and I treated my dog to a whole one for his supper.

The weka, or wood-hen, is the most useful and valuable bird to a bush-ranger, and in the months of May, June, and July, when they feed on the berry of the karamu, they get very fat, and attain to a great size, and are easily captured by any one who can imitate their cry; for, when they hear their cry, they will answer and approach, and then are very easily caught by a small flax snare tied to a short small stick; but I have taken them with my hands only by shaking a katuhitahi, or robin, before them. They are very pugnacious, and will fly at a bunch of feathers, or a red rag.

15th.—I was surprised, on waking in the morning, to find a fresh in the river, having had but little rain yesterday. We however made a start, and walked a mile down the bank of the river, when the natives found a spot they fancied for eel fishing, and wanted to stop. I got angry, and urged the necessity of proceeding, stating we had enough provisions, and were losing fine weather; so they agreed to come, and I again mounted my load, and went on, but on looking back, I saw the women still at the eel station, and when I remonstrated, only got laughed at; so I was forced to laugh too, for I find there is nothing like good temper in dealing with these natives—besides, I doubt if it would really answer to quarrel with them in these wilds, and so far from a settlement. Fine.

16th.—The game-list for yesterday stood as follows:—Twenty-one wekas, two young Paradise ducks, one grey duck, two dab-chicks, two sparrow-hawks, and three eels. What we are to do with all these I do not know, for eating them while sweet is impossible, and we have no means of keeping them unless we stop and make an air-tight bag of totara bark, which I object to on account of the delay. There is some difference between the stock of provisions I now have, and my dietary in the month of May last year. Such is a bush life, full of feasts and fasts. After the fog had risen, we commenced our day's march, and after travelling 5 miles down the shingle on the banks of the river, we came to a moderately-sized stream flowing from the S.E., the appearance of which caused me to leave my load, and take a short trip up its banks. It had a very inviting appearance, and having ascended rather more than a mile, I came to a large patch of land, consisting of fern, grass, &c., of perhaps 12,000 or 14,000 acres in extent, and belted by a forest of fine large pines, which also covered a large extent of level land. Returned to my load, and proceeded forwards, taking the shingle of the river, and after a walk of 4 or 5 miles we camped. After arranging our sleeping quarters, and eating our supper, Ekehu caught eleven wekas, all within sight of our camp.

Ekehu found a kaka's nest at this place, on the top of a large birch-tree, which he ascended by an ingenious method. He cut and tied together several long light poles, at the end of which he secured a short crooked stick, by which he was enabled to hang from branch to branch, and thus ascend the butt easily, and return with four young birds, which we tried to keep alive.

I believe if we had provisions spoiling for want of eating, and had loads under which we could scarcely stagger, nothing would induce Ekehu to pass a weka, or remain at the fire if there was the chance of an eel in the river, so great is his natural love of destruction. Last night I pressed on him to forbear fishing, but no—he must be off, and return with twenty eels.

17th.—Another fine day, and again on our way, still keeping to the banks of the river. The river is now rapidly increasing in size, from the drainage of the surrounding country.

18th.—Proceeded about 5 miles, when the appearance of the day induced us to stop and erect a shelter in a fine manuka grove, using the bark of the trees for thatch, which is very watertight, and quickly obtained; but the frame must be made very high, from its combustible nature.

19th.—Wet day, and sand-flies very troublesome.

20th.—Accomplished 4 miles down the shingle, the country appearing of about the same character, namely, a large tract of very fine timber land on either bank of the stream, when we came to a part of the river shut in between two low cliffs of a kind of limestone, but level on the surface, and still covered with pines: these cliffs lasted nearly 3 miles. Proceeded two miles past them, and camped, the rain of yesterday rendering it difficult to cross.

21st.—This morning we had to take a most formidable ford, but managed to cross safely, with the exception of wetting Epika's load. We then proceeded nearly 2 miles, when Ekehu, after taking another awkward ford, in ascending the bank, missed his footing, and fell into a hole over head and ears, which

caused us to stop and kindle a fire to dry his kit. When all was right again, we made another start, and proceeded about 2 more miles, when we stopped, and erected a shelter against the falling rain. A bystander would have laughed, if in comfortable lodgings himself, to have watched us in erecting our shelter by fire-light. Having constructed our frame-work, the thatch, or covering, was the difficulty, each seeking for enough to cover his own sleeping-place; and as we discovered, or rather felt a bush of fitting materials, we would snatch up a fire-brand and brave the storm for another handful of grass, tottoi, or any other accessible material—so that about midnight we could call our covering water-tight for a bush house.

March is the most difficult month in the year to ford rivers, owing to the growth of a slippery kind of moss on the surface of all the stones that form the beds of the rivers. I found it easier to take the deep water than the shallows in this month.

Tried a new species of fruit, the berry of the moko, and found it very palatable when you have obtained the proper knowledge of eating them. You must gauge your mouth so that your teeth will only crush the berry without breaking the seed, which has a most nauseous, bitter taste.

22nd.—A fresh in the river, and the unpleasant drip of the bush, with a plentiful supply of provisions, were sufficient excuses for remaining under our comfortable shelter.

23rd.—Fine. After crossing the river five times breast high, for the sake of getting shingle walking, we came to a reach of the river, looking down which we could discover the country of the Buller, and my companions were off at a canter to try which would be first to make the river. On arriving, we found it to be much swollen. We walked about 7 miles during the day. The appearance of the country the same as before, with the exception of soap-stone forming the bed of the river instead of shingle.

24th.—Again on my way for Nelson—at least I think so, as I am now retracing my steps on the banks of the Buller, the only change being that I am on the southern bank. Made a moderate day's walk. Found a kaka's nest with five young birds.

25th.—Moved forwards at a good pace, and accomplished three days of our outward journey on the other bank in two days.

26th.—Last night took a draught with our net, and caught about fifty upukororo.

27th.—Accomplished a distance of about 3 miles of, I believe, the worst walking to be found in New Zealand, and 2 miles rather better. By night-fall we reached a small fern patch, where we had to erect a shelter by fire-light. Rain at night.

29th.—Made a start, and proceeded at a gallant pace until we came to our former fearful descent of the 5th of April of last year, when we had to ascend a steep hill, which took us the remainder of the day.

30th.—Very bad walking, the immense granite rocks that belt the river defying us to follow its course, and the mountains too high to ascend, so our day's travelling was one continual climbing up the spurs and descending into the water-courses. This labour enabled us to make only a short distance by night, which unfortunately threatened rain.

31st.—As predicted, just as we were turning in under our blankets last night the rain poured down, but we managed to find squatting room under a large dead tree that was blown down, and keep tolerably dry until morning, when we built a shelter.

April 1st.—Fearfully heavy rain, with gusts of wind, which drove the rain through and under our shelter, and gave us all a thorough soaking. Luckily, Ekehu caught enough eels to last us two days with moderation.

3rd.—Rain continuing to fall in torrents. About midday there came a stream pouring from the cliffs under which we were, and through the shelter

which we had been working at all day to make comfortable, erecting mud fences, &c. The fresh also increased so much, that the natives declared we must find some means to ascend the cliff, or we should be all carried away; so we made a sort of ladder, and managed to clamber up about 20 feet to another ledge in the rocks. The bush here prevented us from moving either backwards or forwards, but we contrived to draw up enough of our old shed to erect a shelter against the wind, for against the rain it was impossible, as the thatch we had barely kept our kits dry, and we had to brave the rain until the morning, when we erected a staddle bedstead, as the uneven surface of the granite prevented us from lying down.

4th.—Made our shed habitable. Rain continuing. This was truly a fearful day to spend on a cliff in a black-birch forest. The rain poured down, loosening the stones of which the hill was formed, which came rolling by us, and plunged into the river with a tremendous noise; and the wind tore up the trees on all sides, causing a simultaneous shudder among all the party when we heard their crash.

We managed our dietary during the last rain without encroaching upon our stock of provisions, there being sowthistle at hand, which we ate at every meal. When I left Nelson, Mr. Heaphy smiled at my stock of pepper, from its quantity and bulk; but, were he here, he would find it a great relish to his sowthistle, &c. On inspecting our stock, I found that I had nearly 1 lb. left, some proof of my economy in the consumption of the luxuries of this life. I would recommend any one to take a good quantity who may be bound to the bush.

Ekehu's kaka died, leaving only nine alive to mourn the fate of their brother, and I fear they will die also.

My last pair of unmentionables are now brought into active use.

5th.—An increase in the gale, both of wind and rain, and the fresh in the river exceeding all bounds, which has risen 40 feet perpendicular. God only knows when we shall be able to proceed; for to ascend is impossible, and we can move nowhere until the flood subsides.

7th.—What after so much rain may be called a fine day; and should the morrow be fine, I hope to be once more moving. The fresh rapidly going down.

8th.—The fresh having a little subsided during the night we managed to get a short way along the cliffs, and then ascend a monstrous hill, that is, for steepness; but we kept on all day, scarcely allowing time for breathing, and by dusk reached the river's edge past the range of cliffs, where we camped.

9th.—The weather is determined to try our constitutions, for soon after rolling our blankets round us last night it commenced raining heavily, and continued all night, so that by morning we were all soaking wet through. We then commenced building a shelter, but the rain ceasing, we moved on about 1 mile to a shingle beach, where we spread our kits to dry.

10th.—This long rain caused so great a flood in the river that we consumed all our dried fish, and were not able to catch any more; and as there were no birds in the bush, I told the natives we must push on, although it was raining, and endeavour to get a supper, which we did out of a fern-tree. Made a good day's march.

11th.—Again progressing, and making for Nelson, but our walking was slow, owing to Epīke's lameness. The fresh still presented an obstacle to eel-fishing; and we could now find room for some of our surplus provisions on the Oweka. Bad lodging on a granite rock, without firewood, and, what was worse, no supper.

12th.—Two hours before daylight the rain again began to fall, and continued in small showers all day; but having no breakfast, we had no alternative but to brave the storm and seek one. After walking about 4 miles we came to a small patch of sand, when we saw the upukororo re-ascending the river from

the flood; and having no provisions, we camped, and made our kupenga all right, when we set to work to fish for breakfast. We took 150 fish during the day. There being no material for erecting a shelter, we had to hoist our blankets for a shed, but found a year's bushing had made a sad alteration in their waterproof qualities.

13th.—Continued at our station fishing. Caught about the same number as yesterday, which we dried for our onward use.

14th.—After packing our fish we started, and made a good day's journey on a bad road. Showers.

15th.—During the night I lost the entire use of my side, and in the morning I could not move. Although I had never before been any hindrance to the natives, always carrying my share of the loads, and helping to get firewood, &c., I had the mortification of hearing one of them, Epika, propose to Ekehu to proceed and leave me, urging, that I appeared too ill to recover soon, if ever, and that it was a place devoid of food; but Ekehu refused to leave me, and Epika and wife started forward by themselves. I received great kindness from Ekehu and his wife for the week I was compelled to remain here; the woman kindly attending me, and Ekehu working hard to obtain food for us all, always pressing me to take the best, and frequently telling me he would never return to Nelson without I could accompany him. We had a slight shower during the day, but Ekehu built a shelter over me, which protected me from the weather.

19th.—Fine. Ekehu went searching for food, our supply of fish being spoilt, and returned with nothing but two or three thrushes, and a fern-tree.

22nd.—Although I could only stand on one leg, I resolved to try and proceed, Ekehu having scoured the country without finding anything eatable within reach, and he would not leave me for a night; so he carried our bed-clothes forward, and then came for me, partly carrying, partly leading me along.

23rd.—I was able to proceed, though with difficulty, by the aid of a stick and Ekehu's hand.

24th.—It was with great difficulty I could move at all to-day, but want of provisions compelled me. Found two fern-trees, and made an oven.

25th.—About mid-day we overtook Epika and wife, who had been clearing the country of all birds before us. I was unable to proceed without a helping hand, or to carry my load. Rain.

26th.—Reached a stream flowing from the southwards, called by the natives Muri-ira. It is opposite to our cave and former return station to Matukituki. We tried to ford the stream, but found it too deep and rapid. Rain.

There is some considerable quantity of good forest land on the banks of the Muri-ira, and the natives told me that there is a grass plain at its source, to which they formerly resorted in search of the kakapo, or green parrot. The route they took was over the hills of the Oweka. The Ngaitau natives told me that before the introduction of the potato they lived chiefly on the kakapos, which were numerous on the mountains of this island, but are now nearly extinct.

27th.—Finding no materials to form a raft, we were obliged to ascend the stream in search of a ford. We kept walking all day, and found many likely spots, but on trying them they were all too deep. Rain.

28th.—After ascending the river 4 miles further, we came to a division of the stream caused by an island, with a short shingle reach on either bank. Up to this point, it had been confined between large rocks. Here we ventured to cross, all holding one stick, and leached the other side in safety, having had to swim part of the way over, and of course thoroughly wetting our clothes, &c., which took some time to dry, as it kept raining all day, and being in a pine forest we could find nothing for a shed. We however managed to find firewood in plenty, and having a very wet night we all sat

round the fire under the shelter of our native mats, but the rain and cold made us very uncomfortable. We had empty stomachs also, being without supper; nor had we anything for a breakfast.

29th.—The day consumed in retracing our steps on the other bank of the river towards the Buller. Fine.

Sunday, 30th.—Ekehu said that hunger was no Sabbath keeper, so we proceeded, and reached the banks of the Buller, where we slept. Rain.

May 1st.—Collected fern-root, and caught some wekas, after reaching our old shelter at Matukituki, which we found standing.

2nd and 3rd.—Collected fern-root, and caught some wekas. Made an oven of the roots of the ti.

7th.—I am again feeling much pain in my side, and am unable to use it. My eye and hand also much affected.

8th.—Finding I was unable to move, Epike and wife went off seeking wood-hens. Ekehu with me.

11th.—Ekehu built a new house, our old one being neither wind nor water-tight. Epike returned. He is a greedy old fellow, and I should have been better, and have had better fare, without him. In this instance, although we afterwards saw the feathers of many birds, yet he returned with only one poor one, and told me it was all he could get, and that he purposely saved it for me. I found it best never to quarrel with him, so I took the bird, and thanked him.

13th.—Moved into our new house, which we found both warmer and drier. The fresh in the river caused Ekehu to remove to higher ground. The old house, built here by him some years ago, was washed away, showing that the flood had risen higher than it had done for many years.

14th.—I am still without the use of my side, which gives me pain on a change of weather.

15th.—Ekehu collecting ti roots. The river is much swollen, and even if I were able, I doubt if I could progress, owing to the snow. I was also taken ill with a violent retching, which lasted all day and night, and my side gave me much pain. I attribute it to the bad living and the cold weather, both clothes and food being very scanty.

We left here all our old clothes (none of which I had previously thrown away, reserving them for patches), my pot, two specimens of green stone—one about 16 inches long and 6 broad by 1 thick, and considered valuable by the natives, the other smaller—some pieces of mica slate, a stone for polishing the green stone (with which I had found means to amuse myself on wet days), three good nets, and many small things, which Ekehu secured. Both he and Epike told me that they intended returning here. They cleared, during our stay, a piece of land, on which they planted about 150 potatoes, brought by us from the Mawera, and a quantity of Swede turnips and native greens. They have each runaway wives, and are afraid of returning amongst the natives from the fear of losing them, and of going back to their former servitude, both being the slaves of E Iti, the chief at Motueka.

19th.—This morning Epike and wife started for Nelson, but I refused to proceed from inability. Ekehu and wife went out to search for food, so I was left alone during the day. Ekehu returned in the evening, and said he was anxious to proceed, and I told him I would try in the morning.

20th.—I resolved to make the attempt, and we packed up, leaving all we could behind us, as I was unable to carry anything. We reached the Tutaki, and ascended about 1 mile to a ford, which we crossed over, when we found Epike bird-catching. We gave him some berries in exchange for some wekas, and had a good supper.

22nd.—Reached the end of the valley, and camped. A slight fall of snow or small rain all day. We sought the shelter of a large totara-tree for the night.

23rd.—This morning we found a kohaha tree, the berries of which the

natives are very fond of. This delayed us some time. Proceeded a short distance, and camped on the banks of the Tiraumea. Wet night.

24th.—Our clothes being wet from last night's rain, we proceeded to the shelter of last year—an overhanging rock, which protected us from the rain. Dried our clothes, and spent the day here. A small basket of mine, which was hung to the roof of our rock to dry, fell down during the night on the fire, and was burnt, by which I lost all my sketches, several skins of birds, some curiosities, and some memoranda, the loss of which may cause my journal to seem incomplete in many places.

25th.—We came on a short distance, and built a shelter against the rain or snow, which seems to fall here every day towards evening during the winter months.

26th.—This morning we started, although it was raining hard, and reached our former wari at the Tiraumea towards evening.

27th, 28th, and 29th.—Rain. Our shelter far from watertight, and our bed-clothes saturated with the drip.

30th.—Finer, but an immense fresh in the river. The natives went in search of food, our provisions being exhausted. Ekehu made a waterproof covering of manuka bark, which allowed him to venture out in spite of the rain.

31st.—The natives went off to-day to collect the fern root which they found yesterday. Cold day.

June 1st.—Fine. The rain that fell last night prevents us from moving onwards.

2nd.—We made a start this morning, and found the river so cold, that, after proceeding a short way, we left Epika and wife behind, as they were cramped with the cold. Came to within a short distance of the wood, and camped. Very cold, and no fire.

3rd.—After waiting some time for the coming up of Epika, we proceeded, and reached our former sleeping-place at the junction of a small stream from the hills.

4th.—This morning Epika and wife arrived, having been all night on the hills. They had lost their way, and had had neither sleep nor food since we left them. Made a short distance and camped.

5th.—We reached the Roturoa lake soon after midday, and found the canoe there safe. Slept at our station amongst the manuka.

6th.—Launched our canoe and crossed the lake.

7th.—This morning we were obliged to erect a shelter against the rain. We had two sheds made of black birch, one of which fell down on my lame side while I was lying by the fire, and hurt me much.

8th.—A fresh in the lake had floated our canoe half across before it was seen. Ekehu's wife volunteered to swim for it, which she did, and paddled it back to the shore. After hauling it up safe, we went forwards, and camped on the Puhawini range, but passed a very rainy night, which soaked everything, and kept us sitting up and shivering.

9th.—Reached the river Puhawini, or Howard, and built a shelter which we much needed.

11th.—Walked about a mile to our former station, where we had erected a wari. Searched the country around for food, but found none, and the river too deep to wade.

12th.—Reached our old quarters where I, with Mr. Fox, left our flour, and stopped there, the Rotuiti river preventing progress. I saw six sheep here, and the tracks of a large flock, which much astonished me, as there was no station here when I formerly passed this way. A slight fall of snow all day.

13th.—This morning we with much difficulty crossed the Rotuiti. Saw some hundreds of sheep feeding on the grass here, but no recent shoe or foot-marks; so, having no provisions, I was afraid of exploring for the station or

road, but made the best of my way towards the hill which I had formerly twice travelled over, and consequently knew the track. Fine night.

14th.—Reached the junction of the Mokipiko and Maipo rivers, where we slept. Ekehu caught twenty fine wekas during the day—so we can all once more enjoy a full meal.

15th.—Reached the old survey station on the Mokipiko, and found it fallen down. Ekehu and his wife much wanted to stop here, as Epika and wife were behind, but the rain coming on, I told Ekehu I should push forward and endeavour to spend the night at Fraser's, or at all events on the other side of the Motueka. When I mentioned tea, sugar, and bread, the woman agreed to follow me; so I pushed ahead to prevent hearing the grumbling of Ekehu about sore feet, which, after dark, were sorely pricked by the ground-thorn. We reached Fraser's about ten o'clock at night, whom we found in bed, but he soon arose, and gave me a hearty welcome, and the luxury of a taste of good tobacco.

So, thank God, I am once more among civilized men, of which I have had many doubts during my illness, and this preyed much on my mind. It is a period of nearly five hundred and fifty days from the time I wished Fraser good-bye, on the banks of the river Rotuiti, and my seeing him again at his house, during which time I have never heard a word of English, save the broken jargon of Ekehu and the echo of my own voice; and I rather felt astonished that I could both understand and speak English as well as ever. There have been many wet days when I have not spoken a word all day.

Having traced the banks of the Buller from source to mouth, and returned by the Grey and Inakaiona Valley, I am certain there is no accessible pass across the island N. of the latter place, or any route from the Nelson settlement that could be taken to the grass plains at Port Cooper, excepting that along the coast from the Wairau.

I have not attempted to lay down the course of my journey, nor even the distance I have passed over, as I felt it impossible to do so with any regard to accuracy. Starting as I did on a purely amateur trip, single-handed, and having everything to carry myself, I could take no instruments, save a single compass and a sextant, which were soon spoilt by the wet—so that I found it impossible to take any bearings on a crooked river, or in a black birch country; and I decline to assert anything which may hereafter be found incorrect. Being also unacquainted with geology, I am unable to give any description of the country. I only went to assure myself of the description of country in the middle and west of the island; to explore the country would require more than one person of greater knowledge, and also much more capital than I had at my command. I am, however, sure there is nothing on the W. coast worth incurring the expense of exploring, but I certainly think the natives there require something to be done for them. They are quiet, and do no harm, and ought to have some share of the attention that is paid to the natives who are amongst the white population. They have all books, both Bibles and Prayer-books, but their condition would be much improved by giving them a few good axes, and some other tools, as also some nails, of which they are very fond, and know the value. They are much cleaner in their habits than the natives in the settlements, and they have better houses—most of them having chimneys, and also bedsteads, or rather a raised floor on which they sleep. I trust something will be done for their welfare, in which I take great interest. It would be a very trifling expense to convey a few things to the Kawatiri, from whence the natives themselves would gladly distribute them down the coast. The introduction of goats would much benefit them, and ultimately ourselves.

I believe any one taking the trouble to read my imperfectly kept journal would consider much time had been lost, and many unnecessary delays had taken place, but I, from experience, can assure the reader to the contrary;

and I affirm none can form an estimate of the many difficulties I had to encounter from the want of means, and being thrown quite on the mercy of the natives; and I consider I have accomplished a great work in having traced the only two large rivers of the W. coast from source to mouth, and maintained myself for eighteen months on the natural productions of this island. I am sorry I lost my sketches, for, though no artist, they were faithful delineations, and would have illustrated, much better than I can describe, the surface of the country I have seen and passed over. Any distance, or estimates of qualities of land I have made are as correct as my judgment (from having been on the Nelson survey-staff) could describe them. I found my native Ekehu of much use—invaluable indeed, but the other three rather an incumbrance—I could have made better progress without them; but to Ekehu I owe my life—he is a faithful and attached servant.

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